

**DRAFT**  
**FINDING OF NO SIGNIFICANT IMPACT**

**1.0 NAME OF PROPOSED ACTION.** Predator Force Structure Changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada.

**2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES.** The United States Air Force (Air Force), Air Combat Command and the 99<sup>th</sup> Air Base Wing propose to beddown Predator medium altitude MQ-1 units and Predator high altitude MQ-9 units at ISAFAF. The proposed beddown would involve adding up to approximately 50 Predator unmanned aerial vehicles (UAVs) to the approximately 40 Predators currently assigned to ISAFAF, extending Runway 13/31 by 400 feet, assigning required personnel, upgrading existing facilities, and constructing new facilities.

Three beddown alternatives are considered in this EA. Alternative A consists of the 11<sup>th</sup> Reconnaissance Squadron (11 RS), the 15 RS, the 17 RS, and the 53<sup>rd</sup> Wing Force Development Evaluation (FDE) and the MQ-1 Field Training Unit (FTU) as separate units with their own aircraft. The total aircraft under Alternative A would be approximately 76 aircraft. Approximately 30 construction projects, including the 400-foot extension of Runway 13/31 at ISAFAF and new munitions support structures at Nellis Air Force Base are proposed for the beddown action under either Alternative A or Alternative B. Alternative B includes all the assets and construction of Alternative A and adds an MQ-9 FTU with 12 MQ-9 aircraft and associated support systems. Alternative B would have approximately 88 aircraft. Alternative C consists of the 17 RS, an FDE with MQ-1 and MQ-9 assets, and an FTU with MQ-1 and MQ-9 assets, for a total of approximately 48 aircraft. Seven ISAFAF construction projects, including the extension of Runway 13/31, would be included under Alternative C.

The No-Action Alternative would continue to beddown approximately 40 Predators at ISAFAF. Under the No-Action Alternative no decision to beddown additional Predator MQ-1 and MQ-9 assets at ISAFAF would be made at this time.

**3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES.** The Environmental Assessment (EA) provides an analysis of the potential environmental consequences associated with an additional Predator beddown at ISAFAF. Environmental consequences of Alternative A, Alternative B, Alternative C, and the No-Action Alternative were evaluated for potentially affected environmental resources. The No-Action Alternative results in no changed environmental effects but has the potential to impact the Congressional direction to rapidly field Predator assets.

The EA finds that the proposed beddown of additional Predator aircraft, the construction of associated new and upgraded facilities, and the additional airspace activity would not result in significant impacts for any environmental resource area. The following summarizes the findings of the analyses:

**Airspace Management and Use.** Predator sorties under Alternatives A and B would increase daily use of airspace within the Nellis Test and Training Range (NTTR) by approximately 45 to 63 flight hours. Use of the R-2508 Range Complex in California would increase by approximately 15 flight hours per day. These sorties would be scheduled with airspace

managers and integrated into flight priorities. Alternative C would have no noticeable effect on airspace management and use.

**Safety.** Predator Class A mishap rates are consistent with other new weapon systems and with the Predator, do not place pilots at risk. Ground safety, explosive safety, and flight safety issues were assessed and found to be adequately protected. The increased storage and shipment of Hellfire missiles from 50 to 140 under Alternative A or Alternative B or from 50 to 100 for Alternative C (no increased storage) would follow existing operational requirements and procedures. The runway extension and operational limitations on Runway 13/31 would serve to protect public safety.

**Noise.** The maximum increase in Day-Night Average Sound Level (DNL) noise under any beddown alternative would be less than 1 dB, an indiscernible increase.

**Air Quality.** Annual operational emissions under Alternative A or Alternative B would be 38.2 or 49.5 tons per year (tpy) of NO<sub>x</sub> and less than 4 tpy of PM<sub>10</sub>. Construction PM<sub>10</sub> could be approximately 61 tpy for four years. All emissions would be within regulatory limits. Short-term construction emissions under Alternative C would be approximately one-half of those for Alternative A or Alternative B, and long-term emissions under Alternative C would be less than the No Action Alternative.

**Water and Soils.** Construction of facilities would not substantially alter existing topography, and would not be located within a floodplain. Alternative A or Alternative B would increase water usage at ISAFAF from 98.6 acre feet per year (AFY) to approximately 110 AFY. This is within state water allocated resources. Alternative C would reduce water usage below the No Action Alternative.

**Biological Resources.** Procedures to avoid potential impacts on the desert tortoise or burrowing owl would be incorporated into construction planning. No other species of special concern are likely to be affected. Alternative C disturbs one-third the area of Alternative A or Alternative B. Alternative C has no construction at Nellis AFB.

**Cultural Resources.** Recent surveys have recorded no significant archeological, historical, or traditional resources within the area potentially affected by construction of new facilities under any beddown alternative.

**Visual Resources.** Alternative A or Alternative B would have new construction to the northeast of the current ISAFAF built-up area and would be noticeable from off base. New construction would be consistent with context, location, and scale of other base structures. Alternative C is within the ISAFAF cantonment area and would have no visual effects.

**Land Use.** Alternative A and Alternative B new construction would be outside the current built-up area and would be consistent with ISAFAF General Plan and other planning policies and guidelines. Alternative C actions would be within existing built-up areas and would be consistent with ISAFAF land uses.

**Socioeconomics.** Alternative A increases peak year employment by 765 jobs and Alternative B by 859 jobs. The resulting total peak demand from population for housing and schools would be about 2 percent of the current monthly growth in the Las Vegas area. Alternative C reduces ISAFAF employment by approximately 560 jobs. The consequences of the small beneficial impact from Alternative A or Alternative B or the small negative impact from Alternative C are not likely to be discerned in the dynamic Las Vegas economic area.

**Environmental Justice.** The beddown and military training of Predator assets would not create environmental justice impacts on the nearby community of Indian Springs or in the Las Vegas area.

**Infrastructure.** Fire protection at ISAFAP would be improved under Alternative A or Alternative B. The water supply system is sufficient to meet the needs of additional personnel. The communication, wastewater, and electrical systems would be improved under Alternative A or Alternative B. Alternative C does not include these infrastructure improvements.

**Transportation.** Commuter traffic on U.S. 95 would increase by 8.7 percent under Alternative A or 12.3 percent under Alternative B but would not degrade the level of service due to the excess capacity available on the highway. Alternative C would reduce peak hour traffic by approximately 50 percent.

**Hazardous Materials and Waste.** Implementation of a beddown alternative would involve use of additional hazardous materials and the generation of hazardous waste. The existing 90-day hazardous waste Central Accumulation Site could accommodate these increases. Under Alternative A or Alternative B, one Environmental Restoration Program (ERP) site (landfill LF-02) would be partially located under a planned parking lot northeast of runway 13/31. The Air Force has obtained an ERP waiver for site LF-02, which would allow the proposed construction. Placement of the parking lot over part of the historic landfill would not affect long-term monitoring. LF-02 would not impair parking lot construction or use. Alternative C does not include any substantial change in hazardous materials or waste and does not construct the parking lot.

**4.0 CONCLUSION.** Based on the findings of the EA conducted in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations, and Air Force Instruction (AFI) 32-7061, and after careful review of the potential impacts, I conclude that implementation of the proposed beddown action under any of the alternatives would not result in significant impacts on the quality of the human or the natural environment. Therefore, a Finding of No Significant Impact (FONSI) is warranted, and an Environmental Impact Statement (EIS) is not required for this action.

---

Robert C. Barrett  
Chief, Environmental Division

---

Date

**This page intentionally left blank.**

# Draft Environmental Assessment

## Predator Force Structure Changes at Indian Springs Air Force Auxiliary Field Nevada

United States Air Force  
Air Combat Command

May 2003

Public comments on this Draft Environmental Assessment (EA) are requested. All written comments received during the comment period will be considered during Final EA preparation. Private address information provided with your comment will be used solely to develop a mailing list for Final EA distribution and will not otherwise be released.



# TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS.....	inside front cover
EXECUTIVE SUMMARY .....	ES-1
1.0 PURPOSE AND NEED .....	1-1
1.1 Introduction .....	1-1
1.2 Background .....	1-1
1.3 Purpose of Additional Predator Beddown at ISAFAF.....	1-4
1.4 Need for Additional Predator Beddown at ISAFAF .....	1-4
1.5 Regulatory Framework .....	1-5
1.6 Public and Agency Involvement.....	1-5
2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES.....	2-1
2.1 Proposed Action and Alternatives.....	2-1
2.2 No-Action Alternative .....	2-13
2.3 Alternatives Considered but Not Carried Forward .....	2-13
2.4 Permit Requirements .....	2-14
2.5 Comparative Summary of Environmental Consequences .....	2-14
3.0 AFFECTED ENVIRONMENT .....	3-1
3.1 Airspace Management and Use .....	3-1
3.2 Safety.....	3-5
3.3 Noise .....	3-8
3.4 Air Quality .....	3-10
3.5 Geology and Soil .....	3-14
3.6 Water Resources .....	3-17
3.7 Biological Resources .....	3-19
3.8 Cultural Resources .....	3-26
3.9 Visual Resources .....	3-30
3.10 Land Use.....	3-31
3.11 Socioeconomics.....	3-33
3.12 Environmental Justice.....	3-37
3.13 Infrastructure .....	3-39
3.14 Transportation .....	3-41
3.15 Hazardous Materials and Waste .....	3-42
4.0 ENVIRONMENTAL CONSEQUENCES .....	4-1
4.1 Airspace Management and Use .....	4-1
4.2 Safety.....	4-4
4.3 Noise .....	4-8
4.4 Air Quality .....	4-10
4.5 Geology and Soils.....	4-13
4.6 Water Resources .....	4-14

4.7	Biological Resources .....	4-16
4.8	Cultural Resources .....	4-18
4.9	Visual Resources .....	4-19
4.10	Land Use.....	4-20
4.11	Socioeconomics.....	4-22
4.12	Environmental Justice.....	4-28
4.13	Infrastructure .....	4-29
4.14	Transportation .....	4-31
4.15	Hazardous Materials and Waste .....	4-33
5.0	CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES .....	5-1
5.1	Cumulative Effects .....	5-1
5.2	Irreversible and Irretrievable Commitment of Resources .....	5-6
6.0	REFERENCES CITED .....	6-1
7.0	PERSONS AND AGENCIES CONTACTED .....	7-1
8.0	LIST OF PREPARERS .....	8-1

## **APPENDICES**

- A Agency Coordination
- B Statutes, Regulations, and Guidelines
- C Environmental Restoration Program Waiver
- D Air Quality Technical Appendix

## LIST OF TABLES

2-1	Mix of Predator UAVs at ISAFAF under Three Alternatives.....	2-1
2-2	Annual Training Sortie Requirements.....	2-6
2-3	ISAFAF Proposed Personnel Levels .....	2-7
2-4	Proposed Predator Construction Projects .....	2-10
2-5	Comparison of Alternatives by Environmental Resource .....	2-15
3.3-1	Areas within the 65 to 85 DNL Noise Contours.....	3-9
3.4-1	National and State Ambient Air Quality Standards.....	3-11
3.4-2	2002 Emissions Inventory for Stationary Sources .....	3-14
3.6-1	Annual Allocations for ISAFAF Wells.....	3-18
3.10-1	Existing Land Uses at Indian Springs AFAF .....	3-32
3.12-1	Minority and Low-Income Population in 2000 .....	3-39
3.15-1	Environmental Restoration Program Sites at ISAFAF .....	3-44
4.4-1	Annual Construction Emissions under Alternative A .....	4-11
4.4-2	Annual Operational Emissions Increases under Alternative A.....	4-11
4.4-3	Annual Operational Emissions Increases under Alternative B.....	4-12
4.4-4	Annual Construction Emissions under Alternative C.....	4-12
4.4-5	Annual Operational Emissions Increases under Alternative C .....	4-12
4.6-1	Water Supply Analysis for ISAFAF .....	4-15
4.6-2	Comparison of Annual Water Demands for Alternatives A, B, C, and Existing.....	4-16
4.11-1	Comparison of the Socioeconomic Impacts of the Alternatives .....	4-27

## LIST OF FIGURES

1-1	Predator MQ-1 and MQ-9 Typical Operating Altitudes .....	1-2
1-2	Location of Indian Springs Air Force Auxiliary Field .....	1-3
2-1	Predator System Components .....	2-2
2-2	Predator MQ-1 and MQ-9.....	2-3
2-3	Airspace at the Nevada Test and Training Range and the R-2508 Range Complex .....	2-5
2-4	Alternative A or Alternative B Proposed Beddown Facilities.....	2-8
2-5	Alternative C Proposed Beddown Facilities.....	2-9
2-6	Proposed Utilities Improvements at ISAFAF .....	2-12
3.1-1	Nevada Test and Training Range Airspace .....	3-3
3.1-2	R-2508 Range Complex Airspace .....	3-4
3.3-1	F-15A and Predator Noise Levels.....	3-10
3.4-1	Clark County CO and PM <sub>10</sub> Nonattainment Area and the NTTR Airspace.....	3-15
3.7-1	Vegetation Surrounding ISAFAF .....	3-21
3.15-1	ERP Sites on Indian Springs AFAF .....	3-45
4.3-1	Predator Airfield Noise Emissions.....	4-8
4.3-2	Maximum Airspace DNL Contributions for Predator Alternatives.....	4-9
4.14-1	Lane Volumes and LOS for Arterial Roadways .....	4-32
5-1	Predator and Other Project Facilities Currently Proposed at ISAFAF .....	5-4

This page intentionally left blank.

## **EXECUTIVE SUMMARY**

This Environmental Assessment (EA) describes the potential environmental consequences of proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada that would result in the beddown of Predator MQ-1 medium altitude Unmanned Aerial Vehicle (UAV) units and Predator MQ-9 high altitude assets. The MQ-1 and MQ-9 extend commanders' eyes in the battlespace and provide the ability to transition to a target engagement role when appropriate. The proponents of the action are the Air Combat Command (ACC) and the 99<sup>th</sup> Air Base Wing. Overall, the proposed beddown action would not result in any significant environmental impacts that would warrant preparation of an Environmental Impact Statement.

### **ENVIRONMENTAL IMPACT ANALYSIS PROCESS**

This EA has been prepared by the United States Air Force (Air Force) ACC and the 99<sup>th</sup> Air Base Wing (99 ABW) in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality (CEQ) regulations implementing NEPA; and Air Force Instruction 32-7061, Environmental Impact Analysis Process (EIAP) (32 CFR 989, et seq.).

### **PURPOSE AND NEED FOR ACTION**

The purpose of the proposed beddown is to add up to approximately 50 Predator UAVs to the approximately 40 Predators based at ISAFAF. The UAVs would fly in existing airspace in the Nevada Test and Training Range (NTTR) and nearby ranges currently used for Predator test, training, and weapons evaluation. The combination of new personnel with experienced personnel at ISAFAF provides for transfer of needed skills in response to the Secretary of the Air Force directive to rapidly field the Predator system.

The beddown of the Predator MQ-1 and MQ-9 UAV systems is needed to rapidly apply Predator tactical and strategic reconnaissance and weapons deployment capabilities to Air Force operational squadrons. The beddown of Force Development Evaluation (FDE), Field Training Units (FTU), and operational squadrons is needed to respond to the directives and funding from Congress. Predator development and training squadrons at ISAFAF have the ability to rapidly transition weapon system capabilities in intelligence collecting, targeting, and shooting roles to operational Predator squadrons.

### **PROPOSED ACTION AND ALTERNATIVES**

The proposed Predator beddown involves adding up to approximately 50 Predator UAVs to the approximately 40 Predators currently assigned to ISAFAF, changing personnel assignments, upgrading existing facilities, constructing new facilities, and extending Runway 13/31 by 400 feet. The MQ-1 and MQ-9 Predator aircraft provide a low cost, lethal capability to perform a variety of tactical missions augmenting existing Combat Air Forces (CAF) assets. At ISAFAF, the Predator would evolve as one element of a system of systems, seamlessly integrating manned and unmanned platforms on the ground, in the air, and in space.

Three beddown alternatives are considered in this EA. Alternative A consists of the 11<sup>th</sup> Reconnaissance Squadron (11 RS), the 15 RS, the 17 RS, and the 53<sup>rd</sup> Wing Test Force

Development Evaluation (FDE) and the MQ-1 Field Training Unit (FTU) as separate units with their own aircraft. Alternative A would increase ISAFAF assigned personnel by 101. The total aircraft under Alternative A would be approximately 76 aircraft. Approximately 30 construction projects including the 400-foot extension of Runway 13/31 and new munitions structures at Nellis Air Force Base are proposed for the beddown action under either Alternative A or Alternative B. Alternative B includes all the assets and construction of Alternative A and adds an MQ-9 FTU with 12 MQ-9 aircraft and associated support systems. Alternative B would have approximately 88 aircraft and would increase personnel by 143. Alternative C consists of the 17 RS, an FDE with MQ-1 and MQ-9 assets, and an FTU with MQ-1 and MQ-9 assets, for a total of approximately 48 aircraft. Alternative C reduces personnel by 560. Seven construction projects, including the 400-foot extension of Runway 13/31, would be included under Alternative C. Any new Predator beddown units would continue to fly in Nevada Test and Training Range (NTTR) airspace, including NTTR Military Operations Areas, and nearby ranges where existing ISAFAF Predators are flown.

Under the No-Action Alternative, no beddown decision would be made for the MQ-1 and MQ-9 squadrons at ISAFAF at this time. There would be no personnel changes or construction at ISAFAF, and no new Predator training activities would occur in the airspace. No action could negatively affect the overall program for weapons evaluation of the MQ-1 and MQ-9 aircraft and delay fielding the MQ-1 and MQ-9 for operations and deployment.

## **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

This EA provides an analysis of the potential environmental consequences associated with the additional Predator beddown at ISAFAF. As indicated in Chapter 4.0, the proposed beddown would not result in significant impacts for any environmental resource. The potential environmental impacts of the proposed beddown, based on the findings of the detailed impact analyses presented in Chapter 4.0, are summarized below.

**Airspace Management and Use.** Under Alternative A, annual Predator sorties in the NTTR airspace would increase from 1,080 to 2,988. This equates to an increase of approximately 7.5 Predator sorties per day or an additional 45 flight hours per day over current Predator operations. Predator sorties would occur over a 24-hour period, scheduled and integrated with other use of the airspace. Approximately 1 percent of sorties would be between 10 PM and 7 AM. Annual Predator sorties in the R-2508 Range Complex in California would increase from 174 to 960. This would increase operations from approximately 0.7 to 3.8 Predator sorties per day, or approximately an additional 15 flight hours per day. R-2508 sorties would be scheduled with airspace managers at Edwards AFB. Predator operations in public (Class A) airspace would increase by three out-and-back flights in remote areas as Predators transitioned between ISAFAF and R-2508. Predator sorties would not be in close proximity to other aviation activity. Alternative B would increase annual sorties to 3,720 within the NTTR for an additional 63 flight hours per day. Sorties within R-2508 would be the same as Alternative A. Alternative C has approximately 20 percent more sorties than the No Action Alternative and would have no noticeable effect upon airspace management or use in either R-4806 or R-2508.

**Safety.** Predator Class A mishap rates are consistent with other new weapon systems and with the Predator, do not place pilots at risk. Ground safety, explosive safety, and flight safety issues were assessed and found to be adequately protected by existing operational requirements and procedures. The increased use of Hellfire missiles from 50 to 140 (Alternative A or Alternative B) or to 100 (Alternative C) would require three to five additional munitions shipments between

Nellis AFB and ISAFAF consistent with existing procedures. The extension of Runway 13/31 and operational limitations (no munitions for south launches) would serve to protect public safety.

**Noise.** The maximum increase in day-night average sound level (DNL) noise under any beddown alternative would be less than 1 dB, an indiscernible increase.

**Air Quality.** Annual emissions under Alternative A or Alternative B would be 38.2 or 49.5 tons per year (tpy) of NO<sub>x</sub> and less than 4 tpy of PM<sub>10</sub>. Construction PM<sub>10</sub> could be approximately 61 tpy for four years. All emissions would be within regulatory limits. Short-term construction emissions under Alternative C would be approximately one-half of those for Alternative A or Alternative B, and long-term emissions under Alternative C would be less than the No Action Alternative.

**Water and Soils.** Construction of facilities would not substantially alter existing topography, and would not be located within a floodplain. Alternative A or Alternative B would increase water usage at ISAFAF from 98.6 acre feet per year (AFY) to approximately 110 AFY. This is within state allocated water resources. Alternative C would reduce water usage below the No Action Alternative.

**Biological Resources.** Procedures to avoid potential impacts on the desert tortoise or burrowing owl would be incorporated into construction planning. No other species of special concern are likely to be affected. Alternative C disturbs one-third the area of Alternative A or Alternative B. Alternative C has no construction at Nellis AFB.

**Cultural Resources.** ISAFAF was surveyed for archaeological and traditional resources in 1995, for World War II historic resources in 1988, and for Cold War historic resources in 1994. No significant archeological, historical, or traditional resources are recorded within the area proposed to be disturbed for construction of new facilities under any beddown alternative.

**Visual Resources.** The primary visual impacts of Alternative A or Alternative B would be the new construction to the northeast of the current ISAFAF built-up area. The largest new buildings would be the two hangars for 11 RS and 15 RS. They would be located a little over 1 mile away from Highway 95. The new construction at ISAFAF under Alternative A or Alternative B would be noticeable from off-base but would be consistent with context, location, and scale of other base structures. Alternative C buildings are within the ISAFAF cantonment area and would have no discernable visual effects.

**Land Use.** Beddown activities are consistent with the ISAFAF General Plan and other planning policies and guidelines. Proposed locations of Alternative A or Alternative B operations and maintenance facilities are in compliance with the Functional Relationships Analysis. Alternative C actions are within existing built-up areas. The proposed runway extension is consistent with surrounding land uses, including the Desert National Wildlife Range.

**Socioeconomics.** Peak year direct and indirect employment would increase by a total of 765 jobs with Alternative A, increase by 859 jobs with Alternative B, or decrease by 560 jobs with Alternative C. The total peak year employment associated with either Alternative A or Alternative B would be approximately 2 percent of the monthly growth in the Las Vegas area. The Alternative A or Alternative B job change would have a slightly beneficial effect, and the Alternative C job change would have a slightly negative effect on employment, population, housing, and education, but those effects would scarcely be detected in the Las Vegas area.

**Environmental Justice.** The beddown and military training of Predator assets would not create environmental justice or health or safety impacts on the community of Indian Springs or within the Las Vegas area.

**Infrastructure.** The current fire protection system at ISAFAP is degraded, and would be improved as part of Alternative A or Alternative B. Police and security at ISAFAP is sufficient to support the change in personnel. Existing communication systems are sufficient and would be extended to new facilities. The water supply system is sufficient to meet the needs of required personnel. The wastewater system would be improved as part of Alternative A or Alternative B with sewer lines extended to new facilities and system improvements made to increase capacity and efficiency. The infrastructure improvements associated with either Alternative A or B would not occur with Alternative C.

**Transportation.** Commuter traffic on U.S. 95 would increase by 8.7 percent under Alternative A or 12.3 percent under Alternative B; this would not degrade level of service due to excess capacity on the highway. The East Gate would be improved under either Alternative A or B. Alternative C would reduce the number of commuters by approximately 50 percent and have no gate improvements.

**Hazardous Materials and Waste.** Implementation of a beddown alternative would involve use of hazardous materials and the generation of hazardous waste. The existing 90-day hazardous waste Central Accumulation Site could accommodate the increases. Under Alternative A or Alternative B, one Environmental Restoration Program (ERP) site (landfill LF-02) would be partially located under a parking lot northeast of runway 13/31. The Air Force has obtained an ERP waiver (see Appendix C) for site LF-02, which would allow the proposed construction. Placement of the parking lot over part of site LF-02 would not affect long-term monitoring. LF-02 would not impair parking lot construction or use. Alternative C does not include any substantial change in hazardous materials or waste and does not include construction of the parking lot.

## **1.0 PURPOSE AND NEED**

### **1.1 INTRODUCTION**

The Predator Unmanned Aerial Vehicle (UAV) system was designed in response to a Department of Defense (DoD) requirement to provide continuous intelligence, surveillance, and reconnaissance information to the war fighter. The Predator provides the United States Air Force (Air Force) and other DoD Services with a medium- to high-altitude aerial vehicle capable of sustained operations in a hostile environment. The Predator UAV has been allowing tactical and strategic reconnaissance without jeopardizing aircrews in combat theaters since 1995. Since 1996, the RQ-1 Predator has been flown from Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada, as part of the Nellis Air Force Base (AFB) weapons system evaluation mission. The Air Force proposes to locate or beddown approximately an additional 50 Predators to the current inventory of approximately 40 Predators at ISAFAF.

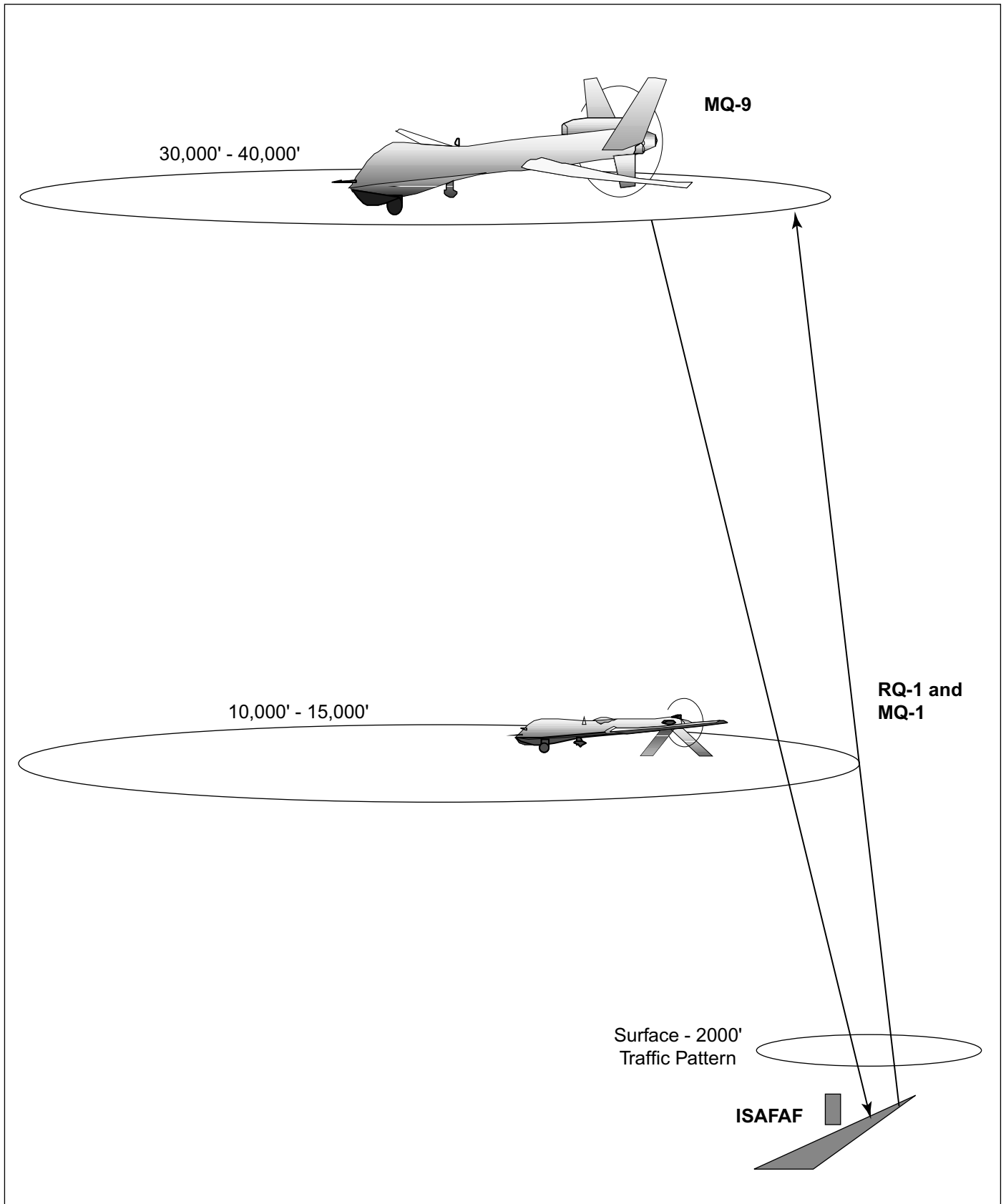
The Predator UAV is a developing weapons system that has demonstrated its value to United States and allied forces continuously in recent conflicts. The initial remotely operated RQ-1 combined the ability to remain over an assigned location, observe activities, and transmit needed high quality information. The additional Predators proposed for ISAFAF would be the next generations of Predators, the MQ-1 and MQ-9.

The appearance of the MQ-1 is very similar to the RQ-1. The MQ-1 is a 29-foot-long medium-altitude UAV that adds additional operational capabilities to the RQ-1. The MQ-9 is a 36-foot-long high altitude UAV with an increased payload and expanded operational capabilities. The intelligence gathering capabilities of the Predator system have been augmented by the ability of the Predator to achieve mission success with air-to-ground munitions. Predator payloads include visual, infrared, and radar sensors capable of detecting, targeting, and, with munitions, destroying hostile forces. Figure 1-1 illustrates the Predator UAVs, the relative sizes of the RQ-1/MQ-1 and MQ-9, and the typical operating altitudes of each UAV.

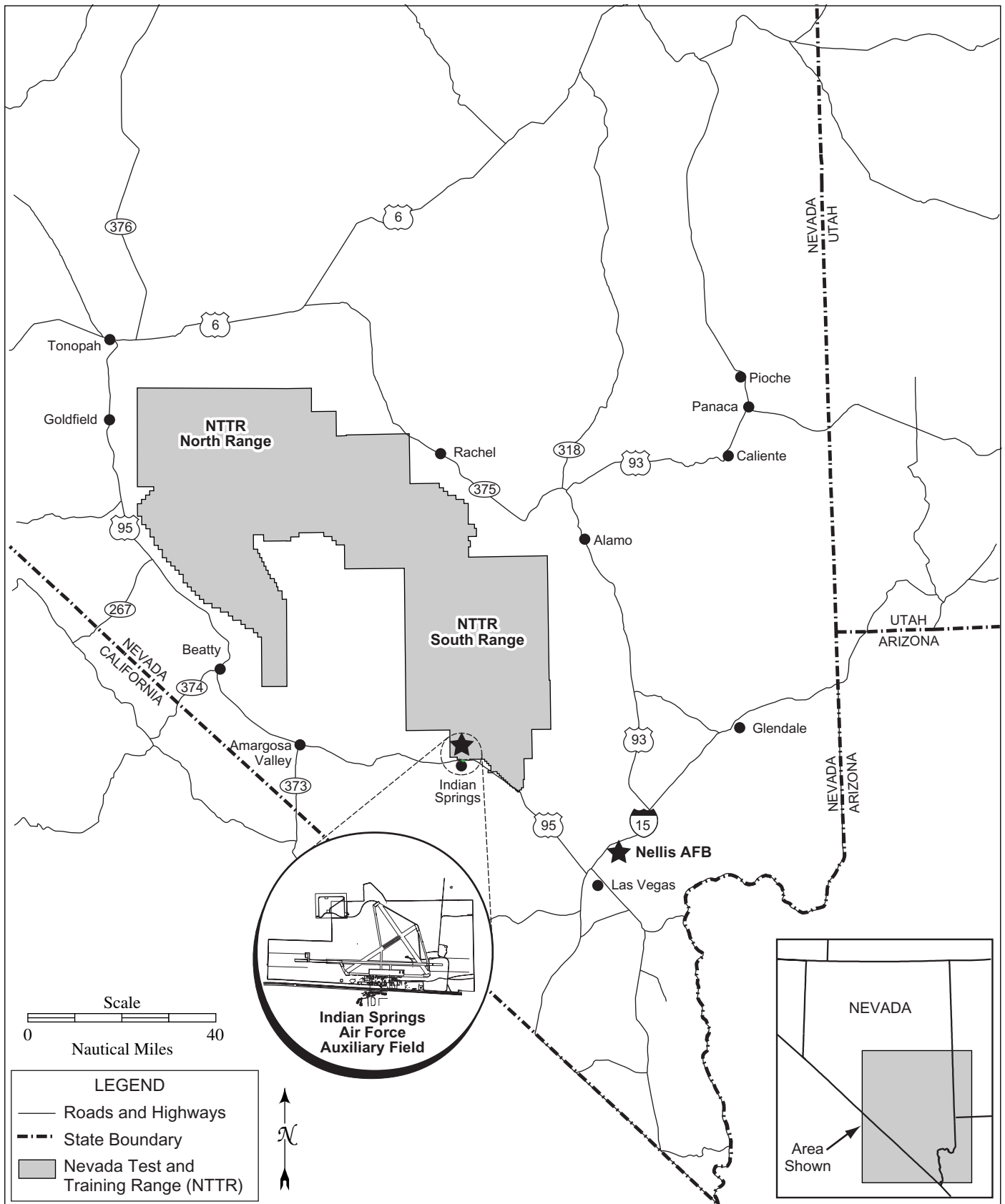
The beddown of additional Predators at ISAFAF would include assigning the necessary personnel, upgrading existing and constructing new facilities, and extending one runway. ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada, adjacent to U.S. Highway 95, and within the overall boundaries of the Nevada Test and Training Range (NTTR) as shown on Figure 1-2. The small community of Indian Springs is located on the south side of Highway 95, directly across from ISAFAF.

### **1.2 BACKGROUND**

The Secretary of the Air Force has directed Predator MQ-1 and MQ-9 development acceleration in Defense Emergency Relief Funds and has requested additional assets. Congress has funded additional assets via Program Budget Decision 736 and FY02 plus up. The Secretary of the Air Force for Acquisition has directed that the Predator be rapidly fielded. The MQ-1 is operational and the MQ-9 is expected to attain Initial Operational Capability by FY05. Predator UAV squadrons at ISAFAF currently support the 57<sup>th</sup> Wing (57 WG) Flying Operations, 99 ABW Security Forces Training, and 98 Range Wing (98 RANW) Southern Operations.



**Figure 1-1. Predator MQ-1 and MQ-9 Typical Operating Altitudes**



**Figure 1-2. Location of Indian Springs Air Force Auxiliary Field**

The three Predator squadrons currently assigned to ISAF AF are the 11th Reconnaissance Squadron (11 RS) with 20 Predator RQ-1 UAVs, the 15 RS with 20 Predator RQ-1 UAVs, and the 17 RS, which was activated at ISAF AF in March 2002 but with no assets. The 17 RS would receive its assets as part of the proposed action under all three beddown alternatives. The 11 RS and 15 RS perform Field Training Unit (FTU) and Force Development Evaluation (FDE) functions. The 11 RS, 15 RS, and 17 RS support the 57 WG, which reports to the Air Warfare Center (AWFC) located at Nellis AFB. Air Combat Command (ACC) is the force provider for the Predator UAV.

The MQ-1 is the upgraded munitions carrying version of the RQ-1 reconnaissance UAV. Under the proposed action, RQ-1 Predators at ISAF AF would be phased out, and all future Predator assignments to units at ISAF AF would be MQ-1s or MQ-9s. The MQ-1 is a medium-altitude endurance UAV that typically operates at an altitude of 10,000 to 15,000 feet, although it can fly as high as 25,000 feet. The MQ-1 Predator is flown by a remote pilot and can carry a payload of about 450 lbs. The MQ-1 is a mid-wing monoplane with a slender fuselage housing the payload and fuel, a high aspect ratio wing, and inverted-V tails. The MQ-1 is powered by a four-cylinder Rotax engine that requires 100-octane aviation gas and can operate in excess of 24 hours without refueling.

The MQ-9 is a larger turboprop-powered Predator with greater performance in speed, altitude, and payload. The turboprop engine operates on jet fuel. The standard MQ-9 typically operates at an altitude of 30,000 to 40,000 feet and can carry 3,000 lb. of payload and 3,000 lb. of fuel. Depending on mission and external stores, the MQ-9 can stay aloft in excess of 24 hours at an altitude of more than 50,000 ft. Munitions being considered for the MQ-9 Predator include the AGM-114 Hellfire II laser-guided air-to-surface missile and other direct-attack munitions currently used on NTTR.

Each MQ-1 and MQ-9 Predator system is composed of three parts: the air vehicle with its associated sensors and communications equipment, the ground control station (GCS), and the product or data dissemination system. One Predator system has four air vehicles with sensors and data links, one GCS, and one Trojan Spirit II Satellite Communications (SATCOM) system.

### **1.3 PURPOSE OF ADDITIONAL PREDATOR BEDDOWN AT ISAF AF**

The purpose of the proposed beddown is to base Predator MQ-1 units and add Predator MQ-9 units with associated support equipment and facilities at ISAF AF. The beddown of additional Predators at ISAF AF permits the use of existing airspace, existing training ranges, and existing facilities already being used by Predator squadrons. In addition, the combination of new personnel with experienced personnel at ISAF AF provides for direct transfer of needed skills in response to the Secretary of the Air Force directive to rapidly field the Predator system. Three alternatives under consideration are described in section 2.1.

### **1.4 NEED FOR ADDITIONAL PREDATOR BEDDOWN AT ISAF AF**

The beddown of the Predator MQ-1 and MQ-9 UAV systems is needed to allow training in tactical and strategic reconnaissance without jeopardizing pilots and crews. The beddown of FDEs, FTUs, and operational squadrons is crucial to respond to the directives and funding from Congress to rapidly have the ability to effectively execute missions. The beddown at ISAF AF

meets the need for command and control through the Air and Space Operations Center. Development, training, and operational Predator squadrons at ISAFAP have the ability to rapidly transition among intelligence collector, targeting, and shooter roles. The trained personnel currently assigned to ISAFAP Predators create a synergistic atmosphere that encourages the rapid transfer of skills to new personnel.

NTTR and other nearby ranges, such as R-2508 north of Edwards AFB, permit full development of the Predator system at ISAFAP. The airspace supports long loiter opportunities and provides extended target area coverage. The MQ-1 and MQ-9 beddown at ISAFAP offers commanders and planners a capability to perform a wide variety of tactical missions augmenting existing Combat Air Forces assets. At ISAFAP, the Predator would evolve as one element of a system of systems, seamlessly integrating other platforms (manned and unmanned) on the ground, in the air, and in space.

## **1.5 REGULATORY FRAMEWORK**

The Air Force's decision regarding the proposed beddown is a federal action subject to requirements of the *National Environmental Policy Act* (NEPA) (42 United States Code 4321 *et seq.*). This Environmental Assessment (EA) has been prepared in accordance with the requirements of the NEPA to analyze the potential environmental consequences associated with the proposed force structure changes. In addition, this document was prepared in accordance with the following:

- Regulations established by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508) for implementing the procedural provisions of NEPA.
- Air Force Instruction (AFI) 32-7061 (The Environmental Impact Analysis Process [EIAP], 32 CFR 989), which implements Section 102 (2) of NEPA.

## **1.6 PUBLIC AND AGENCY INVOLVEMENT**

In February and March 2003, the Air Force initiated the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process for the proposed beddown. As part of this process, the Air Force contacted local, state, tribal, and federal agencies to inform them of the Air Force intent to prepare an EA for the proposed force structure changes at ISAFAP. The IICEP mailing list and sample IICEP letters are included in Appendix A. Through this scoping process, the Air Force obtained information regarding pertinent environmental issues agencies and the public felt should be addressed in the environmental impact analysis.

Agency consultations were undertaken with regard to cultural resources to comply with the National Historic Preservation Act (NHPA) and regarding biological resources, primarily for compliance with the Endangered Species Act (ESA).

Preservation of cultural resources falls under the purview of the State Historic Preservation Office (SHPO), as mandated by the NHPA and its implementing regulations (36 CFR 800). Under the law and regulations, federal agencies are generally required to ensure that actions they take do not adversely affect significant cultural resources such as districts, sites, buildings, structures, or objects of national, state, or local significance in American history, architecture,

archaeology, or culture. Thus, federal agencies must determine what resources of significance might be affected by proposed actions. The SHPO reviews and comments on findings and identifies the need for mitigation measures that may be necessary to minimize adverse impacts.

The ESA involves consultation with the Department of the Interior (delegated to the United States Fish and Wildlife Service [USFWS]) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or species that could be candidates for listing. The primary focus of this consultation is to request a determination of whether any of these species occur in the region of influence of the proposed action. If any of these species are present, a determination of the potentially adverse effects on the species is made. Should no species protected by the ESA be affected by the proposed action, no additional action is required. State agencies are also responsible for those species listed by the appropriate state.

To facilitate public involvement in this project, the Air Force prepared and issued a Notice of Intent (NOI) to prepare an EA for Predator force structure changes at ISAFAF. The NOI was first published in the Las Vegas Review-Journal on 20 February 2003. A second NOI was published on 21 March 2003.

The Draft EA is available for public review at the Las Vegas Library (Main Branch), the North Las Vegas Library (Main Branch), the Indian Springs Library, and online at [www.cevp.com](http://www.cevp.com) and [www.nellis.af.mil](http://www.nellis.af.mil).



**On 20 February and 21 March 2003, the Air Force issued Notices of Intent to prepare this Environmental Assessment for force structure changes at Indian Springs AFAF.**

## 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter describes the proposed action and alternatives for beddown of additional Predators at ISAF AF. The proposed action can be accomplished through implementation of one of three alternatives, Alternative A, Alternative B, or Alternative C; each is described in section 2.1. The No-Action Alternative is described in section 2.2. Alternatives considered but not carried forward are presented in section 2.3. A summary of Permit Requirements is in section 2.4. A comparative summary of environmental consequences is provided in section 2.5.

### 2.1 PROPOSED ACTION AND ALTERNATIVES

The Air Force proposes to beddown additional Predator systems and construct needed Predator support facilities at ISAF AF through one of three alternatives:

*Alternative A:* Alternative A includes the 11 RS, the 15 RS, the 17 RS, a combined (MQ-1/MQ-9) Force Development Evaluation (FDE), and an MQ-1 Field Training Unit (FTU). Facilities would be constructed, personnel would be assigned, and one runway would be extended.

*Alternative B:* Alternative B includes the 11 RS, the 15 RS, the 17 RS, a combined (MQ-1/MQ-9) Force Development Evaluation (FDE), an MQ-1 Field Training Unit (FTU), and a separate MQ-9 FTU. The same facilities would be constructed as in Alternative A, additional personnel would be assigned for the MQ-9 FTU, and one runway would be extended.

*Alternative C:* Alternative C includes the 17 RS, an FDE with MQ-1 and MQ-9 assets, and an FTU with MQ-1 and MQ-9 assets. Limited facilities construction and remodeling would occur, ISAF AF personnel would be reduced, and one runway would be extended.

The existing (No Action) and proposed mix of Predator UAVs at ISAF AF under each alternative are presented in Table 2-1. Facility requirements are presented in section 2.1.4.

**Table 2-1. Mix of Predator UAVs at ISAF AF under Three Alternatives**

<i>Unit</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Existing Condition</i>
11 <sup>th</sup> Reconnaissance Squadron (RS) (existing)	20 MQ-1	20 MQ-1		20 RQ-1
15 <sup>th</sup> Reconnaissance Squadron (RS) (existing)	20 MQ-1	20 MQ-1		20 RQ-1
17 <sup>th</sup> Reconnaissance Squadron (RS)	12 MQ-1 4 MQ-9	12 MQ-1 4 MQ-9	12 MQ-1 4 MQ-9	No full-time assigned aircraft
Combined Force Development Evaluation (FDE)	4 MQ-1 4 MQ-9	4 MQ-1 4 MQ-9	4 MQ-1 4 MQ-9	
MQ-1 Field Training Unit (FTU)	12 MQ-1	12 MQ-1		
MQ-9 Field Training Unit (FTU)		12 MQ-9		
Combined Field Training Unit (FTU)			12 MQ-1 12 MQ-9	
Total Predator Aircraft	76	88	48	40
<i>Notes:</i> Under the Existing Condition, the FDE and FTU are embedded within the 11 RS and 15 RS. Under the Existing Condition, RQ-1s are being upgraded to MQ-1s.				

### 2.1.1 Predator System Description

The basic Predator system for either the MQ-1 or the MQ-9 consists of four aircraft with sensors, required communications bandwidth and equipment, and a flight control station as depicted in Figure 2-1.

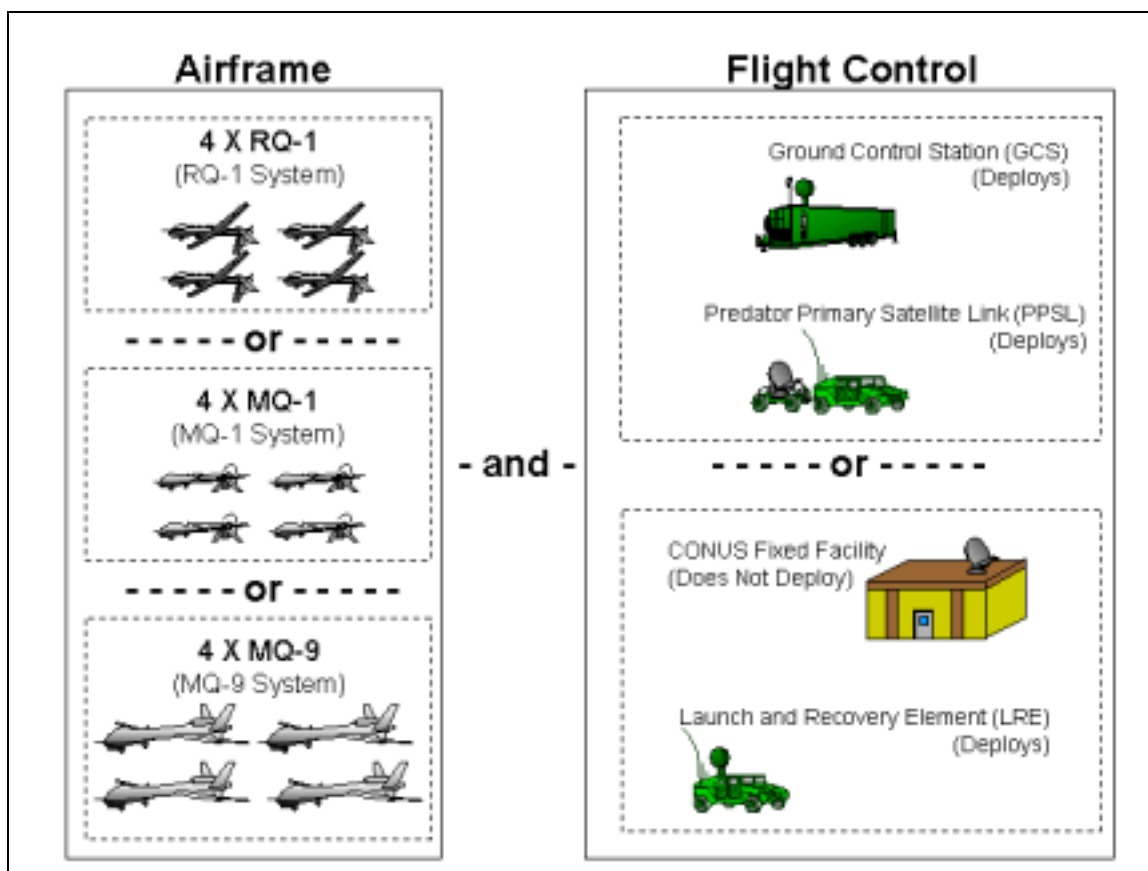
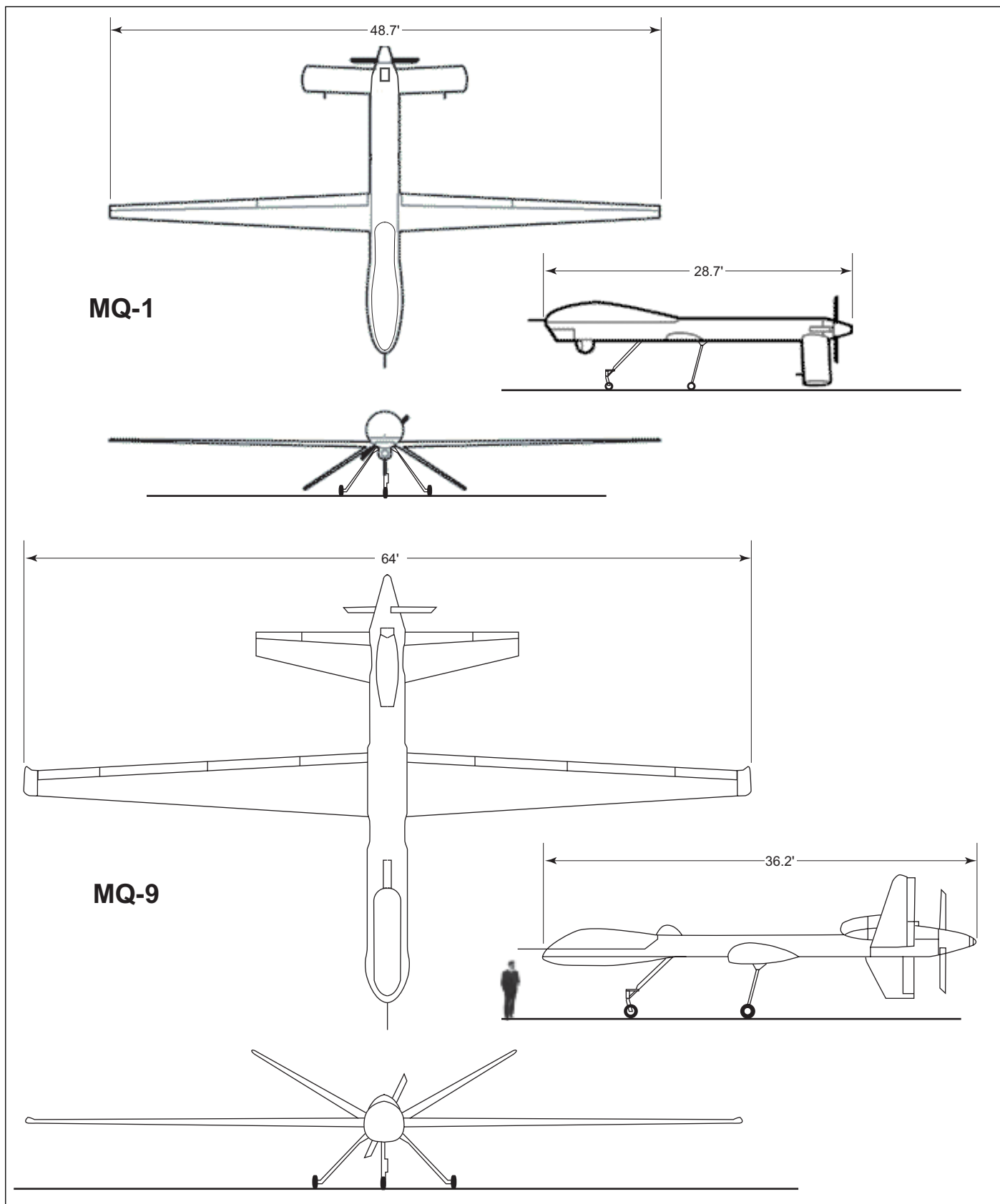


Figure 2-1. Predator System Components

The Predator MQ-1 and MQ-9 are remotely piloted endurance vehicles capable of operation by either line of sight via a direct data link, or beyond line of sight via satellite link. The basic crew operating a Predator consists of a pilot and two sensor operators either inside the Fixed Facility or inside the Ground Control Station trailer. The crew communicates with the Predator using a C-Band line-of-sight data link or a Ku-Band satellite data link for beyond line-of sight flight. If the satellite data link is lost, the Predator is programmed to fly to a safe altitude or location where line-of-sight communication can be re-established. The Predator has communications gear (VHF/UHF/FM radio and multi-mode IFF/SIF), sensors, and wing mounted hardpoints. Each aircraft is designed with multiple mission capabilities and can be equipped with modular payload sensors, external weapons, and sensors to permit tailored missions.

**MQ-1 Predator.** The MQ-1 airframe is an upgraded RQ-1. The 2,100-lb gross vehicle weight MQ-1 (depicted in Figure 2-2) employs the Multi-spectral Targeting System as its primary payload sensor. The payload contains electro-optic and long-wave infrared sensors, laser range finder, laser target marker, laser target designator, and internal radar with 0.3-meter resolution.



**Figure 2-2. Predator MQ-1 and MQ-9**

The MQ-1 can operate up to 25,000 feet in altitude and is capable of carrying and employing two external air-to-ground AGM-114 Hellfire missiles or Stinger air-to-air missiles. The MQ-1's size, composite materials, and small signature increase survivability by complicating adversary acquisition and targeting in a threat environment.

**MQ-9 Predator.** The MQ-9 is a remotely operated single-engine turboprop aircraft offering speed, altitude, and payload advantages over the MQ-1. As depicted in Figure 2-2, the MQ-9 is a larger UAV with up to 10,000 lbs gross weight. The feature distinguishing the two aircraft from a distance is the MQ-9's vertical V-tails as compared with the MQ-1 inverted V-tails. The MQ-9 is capable of altitudes in excess of 50,000 feet and, depending on payload, endurance over 24 hours. Current payload is in excess of 1,500 lbs on six wing and fuselage stations. The MQ-9's increased payload capacity and larger size make it suited for sustained loiter at higher altitudes.

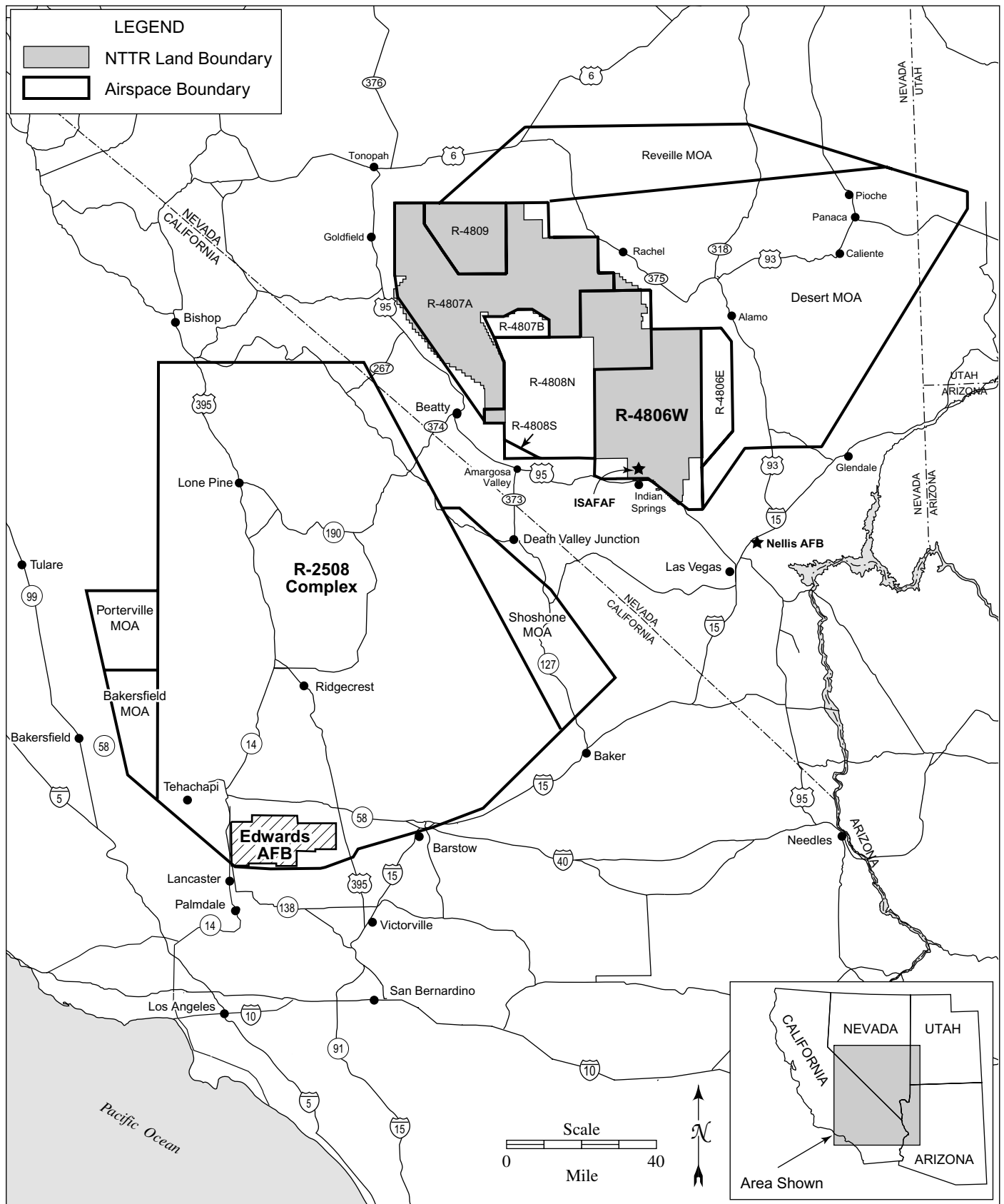
**Predator Operations and Control.** Predator RQ-1, MQ-1, and MQ-9 control can be performed by the stationary Ground Control Station (GCS) or by the fixed facility main operating base (MOB) in the Continental United States (CONUS). Launch and recovery can be performed by the Predator primary satellite link or the Launch and Recovery Element (LRE). All Airframe and Control systems are depicted in Figure 2-1.

The deployable GCS is the operations center for the aircraft and contains payload sensors, laser designator, weapons employment, and information dissemination. The GCS contains common flight control software required for operation of all MQ-1 and MQ-9 aircraft configurations. The GCS is capable of basic data processing and evaluation including automatic target recognition. This allows the mission crew to independently perform identification, surveillance, and destruction of a target as required by mission tasking. At ISAF AF, the GCS functions can all be performed from the Fixed Facility. ISAF AF currently has 10 GCSs to support its RQ-1 Predator Squadrons. Under Alternative A, seven GCSs would be added. Under Alternative B, 10 GCSs would be added. Under Alternative C, the number of GCSs would be reduced to four.

The LRE consists of forward deployed equipment and personnel capable of servicing, arming, and launching/recovering aircraft under line-of-sight control. When deployed, takeoffs and landings would be performed by an LRE, whereas personnel at a different location, such as the CONUS fixed facility MOB, would execute missions. After launch, Predator control of an airborne aircraft is handed over to a remote operations center, such as the CONUS MOB, and Predator control is returned to the LRE when the aircraft has returned for landing. At ISAF AF, the LRE function can also be performed at the Fixed Facility. ISAF AF currently has 10 GCSs and six LREs to support its RQ-1 Predator Squadrons. Under Alternative A, four LREs would be added. Under Alternative B, five LREs would be added. Under Alternative C, the number of LREs would be reduced to three.

### 2.1.2 Airspace Requirements

The Nevada Test and Training Range (NTTR) is a complex consisting of ground and airspace assets for military test and training activities. NTTR airspace includes several Military Operations Areas (MOAs) and restricted airspace areas. The NTTR ground and airspace are presented in Figure 2-3.



**Figure 2-3. Airspace at the Nevada Test and Training Range and the R-2508 Range Complex**

ISAF AF lies within the NTTR and, therefore, has easy access to airspace for flight training operations and approved ranges for weapons deployment. Since ISAF AF is home to the 11 RS and 15 RS operating the RQ-1 Predator UAV, range controllers are already familiar with UAV operations. NTTR is cleared for Hellfire operations to 10,000 feet above ground level in designated areas.

Annual training sortie requirements for each alternative and the existing condition are presented in Table 2-2. Under Alternative A or Alternative B, approximately 75 to 80 percent of daytime Predator training sorties would be flown in the NTTR, primarily in R-4806W (see Figure 2-3). Approximately 20 to 25 percent of daytime sorties would be in the R-2508 Range Complex north of Edwards AFB in California (see Figure 2-3). Transit between military airspaces would be in Class A airspace under a Certificate of Authorization (COA) with the Air Route Traffic Control Center (ARTCC).

**Table 2-2. Annual Training Sortie Requirements**

<i>Location</i>	<i>Day</i>	<i>Night</i>	<i>Total</i>	<i>Increase from Existing</i>
<b>ALTERNATIVE A</b>				
NTTR (R-4806)	2,940	48	2,988	1,908
R-2508 Range Complex	960	0	960	786
<b>ALTERNATIVE B</b>				
NTTR (R-4806)	3,660	60	3,720	2,640
R-2508 Range Complex	960	0	960	786
<b>ALTERNATIVE C</b>				
NTTR (R-4806)	1,250	50	1,300	220
R-2508 Range Complex	210	0	210	36
<b>NO-ACTION ALTERNATIVE</b>				
NTTR (R-4806)	1046	34	1,080	0
R-2508 Range Complex	174	0	174	0
<b>EXISTING CONDITION</b>				
NTTR (R-4806)	1046	34	1,080	0
R-2508 Range Complex	174	0	174	0

Night sorties would be flown only at the NTTR and would occur once per month per squadron. Environmental night sorties, which are defined as occurring between 10 PM and 7 AM for noise evaluation purposes, would constitute approximately 1 percent of total Predator sorties under Alternative A or Alternative B. Although Predator sorties can be up to 24 hours, the average sortie is assumed to be 6 hours.

### 2.1.3 Personnel Changes

Predator manpower requirements at ISAF AF would change as mission requirements change. Currently, Predator operations are assigned 984 officers, enlisted, and civilians. The 98 RANW manages ISAF AF and the Nellis South Range Complex. The 98 RANW provides crash fire

rescue services for airfield operations and contracted services for airfield operations, facilities maintenance, logistics, lodging, dining, services, range and vehicle maintenance, range security, communications, TACAN, structural support for the South Range Complex, and Range Control duties.

An increase in personnel assigned to ISAFAF would support expanded mission requirements under Alternative A or Alternative B. The current and proposed Predator and ISAFAF personnel numbers under each alternative are shown in Table 2-3. Under Alternative A, Predator personnel would increase by 101 persons. Under Alternative B, the increase would be 143 persons. The greater increase for Alternative B is due to the additional FTU for the MQ-9. Under Alternative C, personnel would decrease by 560.

**Table 2-3. ISAFAF Proposed Personnel Levels**

<i>Alternative</i>	<i>Officer Predator/Other</i>	<i>Enlisted Predator/Other</i>	<i>Civilian Predator/Other</i>	<i>ISAFAF Total</i>	<i>Change from Existing</i>
Alternative A	227/4	848/127	10/42	1,258	101
Alternative B	251/4	866/127	10/42	1,300	143
Alternative C	120/4	294/127	10/42	597	(560)
No Action Alternative	187/4	787/127	10/42	1,157	0
Existing Personnel	191	914	52	1,157	0

#### 2.1.4 Facility Requirements

Specific operational requirements for the proposed beddown would be met through construction of new, expanded, or remodeled facilities. The following descriptions provide facility beddown plans for the three alternatives:

- *Alternatives A or B:* The existing facilities currently used by the 11 RS and 15 RS would be occupied by the FTU and FDE functions, which are currently embedded within the 11 RS and 15 RS. The 17 RS with its assigned assets would also reside in the present facilities. New operations, hangars, communications, and other facilities would be constructed for the 11 RS and 15 RS to meet operational and maintenance requirements. Other facilities, including the East Gate, would be improved. Figure 2-4 presents the location of each project under Alternative A or Alternative B. Proposed construction projects are listed in Table 2-4, except projects 28 and 29. Maintenance projects are designated by "U" (upgrade).
- *Alternative C:* An FTU/FDE MQ-9 Hangar Addition and a Ground Control Station Facility would be constructed for the combined FTU and FDE units, and Visiting Quarters (VQ) would be constructed for the FTU students. Figure 2-5 presents the location of each project under Alternative C. A daily average of 25 persons is anticipated at the VQ. Proposed construction includes projects 1, 2, 11, 17, 27, 28, and 29 listed in Table 2-4.

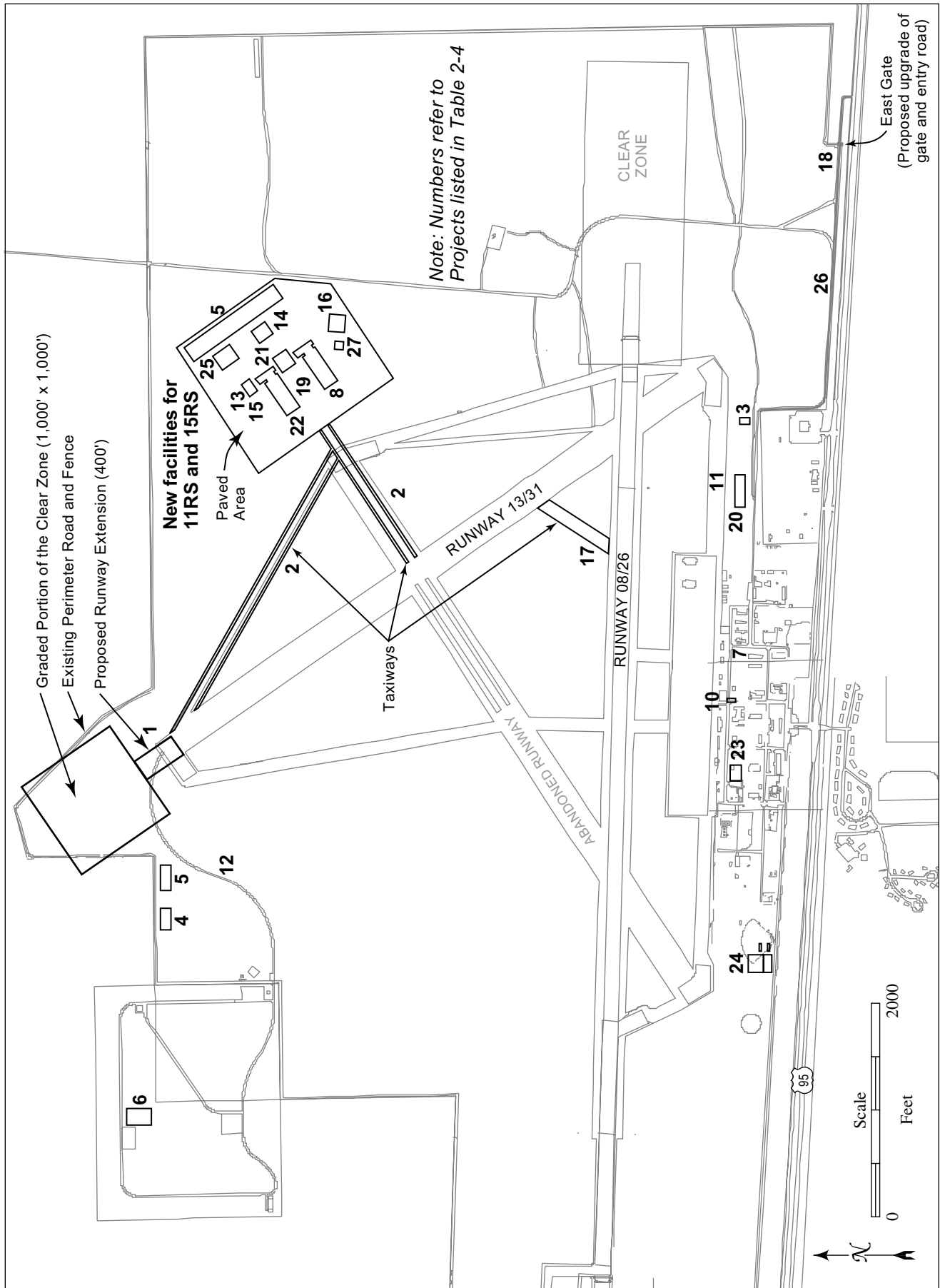


Figure 2-4. Alternative A or Alternative B Proposed Beddown Facilities

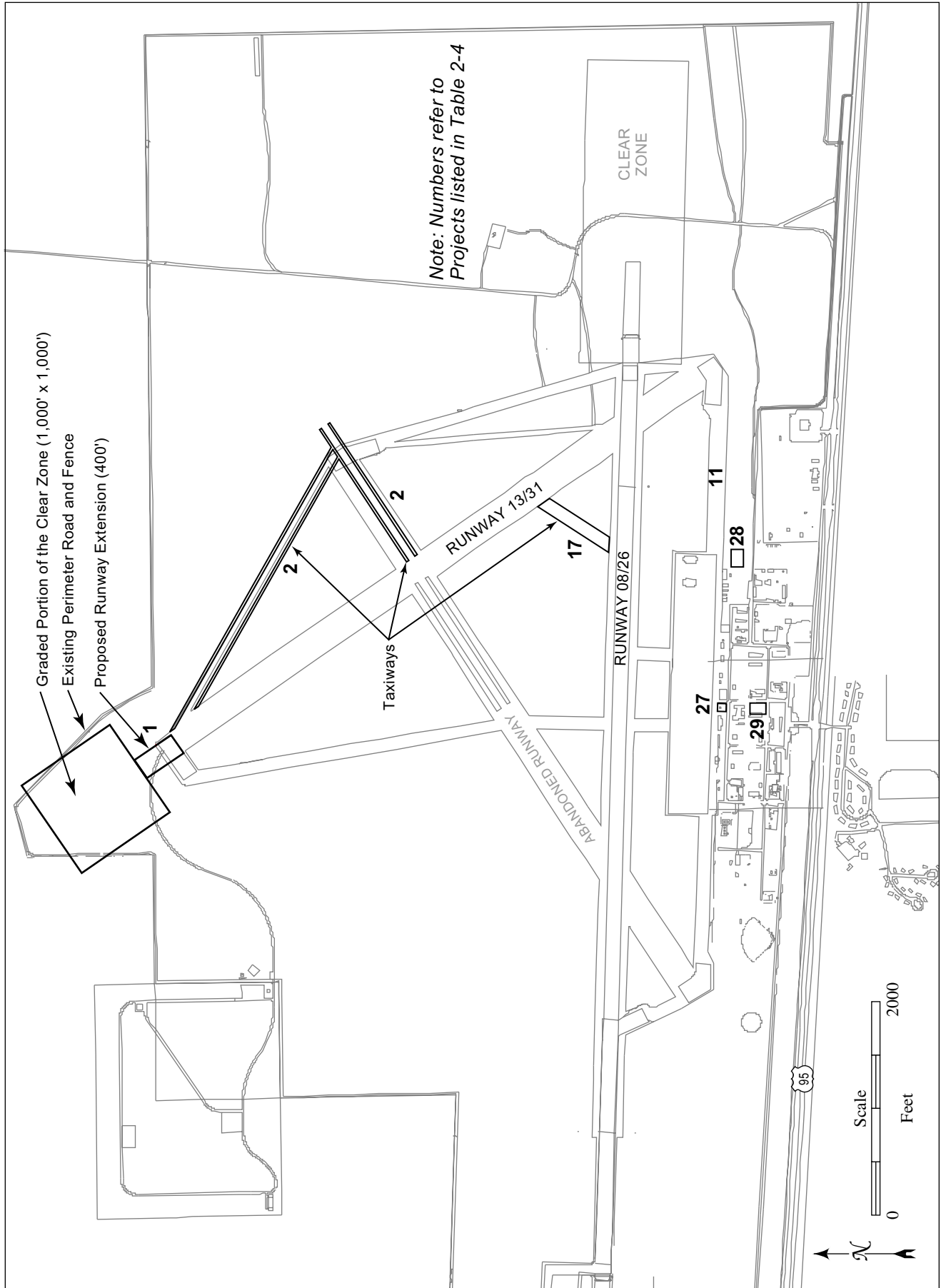


Figure 2-5. Alternative C Proposed Beddown Facilities

Table 2-4. Proposed Predator Construction Projects

<i>Projects</i>		<i>ALTERNATIVES A AND B</i>		<i>ALTERNATIVE C</i>	
		<i>Area of New Construction (sq ft)</i>	<i>Fiscal Year</i>	<i>Area of New Construction (sq ft)</i>	<i>Fiscal Year</i>
1	Extension of Runway 13/31	50,000	FY03	50,000	FY06
2	UAV Taxiway	100,000	FY03	100,000	FY03
3	Aerospace Ground Equipment (AGE) Facility/Yard	3,500	FY03		
U	Force Protection Upgrade (Repair Boundary Wall)		FY03		
4	Munitions Administration Facility	3,000	FY03		
5	Privately Owned Vehicle (POV) Parking Lot	150,000	FY03		
6	Munitions Storage Structure (one at ISAF AF)	1,560	FY03		
7	Interim Modular Facilities	20,000	FY03		
8	11 RS SquadOps/AMU Hangar	69,000	FY04		
9	FY04 Infrastructure (utilities)	48,000	FY04		
10	Fire Department	3,000	FY04		
U	Repair 15 or 11 RS Facility		FY04		FY04
11	Repair Taxiways		FY04		
12	Repair MSA Road		FY04		
13	Flightline Kitchen	3,500	FY04		
14	General Purpose Maintenance Shop	24,000	FY05		
U	FY05 Infrastructure (Communications)	12,000	FY05		
15	AGE Maintenance Facility	14,000	FY05		
16	Fuel Cell Maintenance Hanger	29,000	FY05		
U	Repair 15 or 11 RS Facility		FY05		
17	Construct Taxiway (13/31 to 08/26)	70,000	FY05	70,000	FY05
18	East Gate Upgrades	2,000	FY05		
19	Predator SATCOM Pad	25,000	FY05		
U	Flightline and Perimeter Fence (repair)		FY05		
20	MQ-9 Hangar (addition to Bldg 718)	20,000	FY05		
21	Phase Maintenance Hangar	20,000	FY06		
22	15 RS SquadOps/AMU Hangar	69,000	FY06		
23	Dining Hall	21,530	FY06		
24	Weapons Load Training/Hangar/Academics/Office	20,000	FY06		
25	Parts Store/Casket Storage	32,000	FY06		
U	Munitions Storage Structures (three at Nellis AFB)	7,200	FY06		
26	East Gate Access Road (improve existing road)		FY06		
U	FY06 Infrastructure (Communications)	12,000	FY06		
27	Ground Control Station Facility	8,000	FY06	8,000	FY06
28	FTU/FDE Hangar Addition			40,000	FY06
29	Visiting Quarters (VQ) (UAV TDY FTU students)			36,000	FY06
U	Convert Fitness Facility		FY06		
U	Convert Billeting/Recreation Facility		FY06		
U	Additional Various Facilities		FY06		

Sources: ACC 2003; with updates from D. Webb 2003; U = upgrade projects

The square footage of each project and the fiscal year in which development is proposed are presented in Table 2-4. The numbered items on Figures 2-4 and 2-5 correspond to the numbered projects in Table 2-4.

Under Alternatives A, B, and C, Runway 13/31 would be extended to the north by 400 feet. The current overrun pavement will support runway requirements; therefore, the additional pavement will be about 75 feet of runway and about 150 feet of overrun. The graded portion of the clear zone would then extend fewer than 30 feet beyond the present ISAFAF fence. Operations on Runway 13/31 are currently limited to operations to the north only and would be reactivated to operate in both directions. Runway 13/31 would not be used for south launch sorties with onboard munitions.

### **2.1.5 Munitions Storage**

Alternative A or Alternative B construction projects would be located at ISAFAF with the exception of three of the munitions storage structures, which would be constructed at Nellis AFB. A Facilities Site Survey was performed and identified several sites along Perimeter Road at the Nellis AFB munitions storage area that would be suitable for additional munitions storage structures (USAF 2002c).

The three proposed munitions storage structures are earth-covered igloos approximately 80 feet by 30 feet. Storage structures at Nellis AFB are necessary to accommodate the Hellfire missile system for the MQ-1 and potential future munitions requirements associated with the MQ-9. Under Alternative A or Alternative B the MQ-1 and MQ-9 operational systems would be deployed from Nellis AFB with their munitions. All necessary support equipment and personnel are already positioned at Nellis AFB.

Approximately 50 Hellfire air-to-ground missiles per year currently are expended in conjunction with Predator training operations. Under Alternative A or Alternative B, missile expenditure would increase to 140 per year; under Alternative C, Hellfire use would increase to 100 per year. The transport of Hellfire missiles by truck convoy from storage at Nellis AFB to ISAFAF would increase from the current two to three convoys per year to up to eight per year under Alternative A or Alternative B and to four to five per year under Alternative C.

### **2.1.6 Utilities Improvements**

Proposed utilities improvements at ISAFAF under Alternative A or Alternative B include water supply, wastewater treatment, electricity, and communications. The existing water supply system and wastewater collection system would be extended to support the new facilities east of Runway 13/31, as shown on Figure 2-6.

A new 12.47 kV electrical substation would be installed near the East Gate (see Figure 2-6). Nevada Power Company would provide primary service to the new substation, and ISAFAF would provide secondary distribution to the new facilities (USACE 2003).

Communication lines from the existing communication duct bank at manhole MH13 would be extended to the new facilities east of Runway 13/31 (see Figure 2-6). A vault would be installed outside of the new communication room to support the main duct bank. The GCS Facility would require additional conduits to support GCS antennas. A communication closet would be

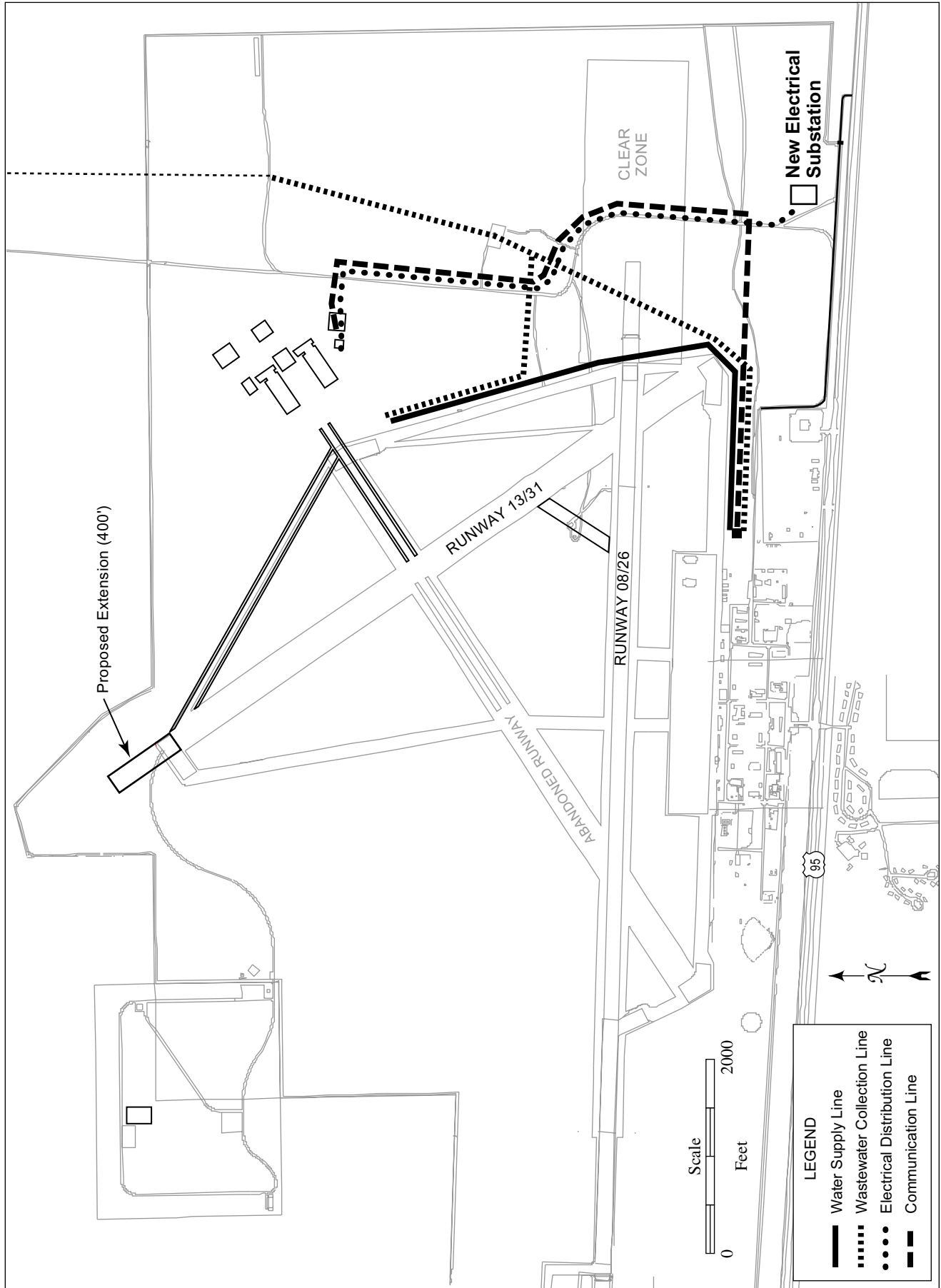


Figure 2-6. Proposed Utilities Improvements at ISAF AF

provided at the flight line end of the hangar for GCS equipment. All new facilities would have individual satellite antennas for CATV requirements. New communication facilities would be designed in accordance with standards delineated in TLA/EIA 568A (USACE 2003).

Alternative C has no new facilities east of Runway 13/31. Utility improvements to support these facilities would not be constructed under Alternative C.

## **2.2 NO-ACTION ALTERNATIVE**

The No-Action Alternative provides a benchmark that enables decisionmakers to compare the environmental effects of Alternatives A, B, or C to continuation of existing conditions. No Action for this EA means no beddown of additional Predator squadrons at ISAFAP at this time. No new beddown personnel changes or construction would occur at ISAFAP, and no new Predator training activities would occur in the airspace. No Action could negatively affect the overall program for weapons evaluation of the MQ-1 and MQ-9 aircraft and delay fielding the MQ-1 and MQ-9 for operations and deployment.

## **2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD**

In compliance with NEPA and Air Force Instructions, the Air Force must consider reasonable alternatives to the proposed action. Only those alternatives determined as reasonably able to fulfill the need for the proposed action warrant detailed analysis. The following presents a summary of alternatives considered but not carried forward in this EA.

### **2.3.1 Beddown at Alternative Locations**

The proposed action is to beddown additional Predator assets at ISAFAP. The Secretary of the Air Force and Congress have instructed the Air Force to rapidly beddown Predator assets. At least five of the 61 Air Force bases with an active flying mission and existing major range and test facility components over land could be considered for Predator operational squadron beddowns. In addition to Nellis AFB (ISAFAP), Nevada; these include Holloman AFB, New Mexico; Edwards AFB, California; Hill AFB, Utah; and Eglin AFB, Florida. These alternative locations were considered but not carried forward for analysis in this EA because the existing Predator squadrons and trained personnel at ISAFAP, when combined with the Nellis AFB mission to evaluate aircraft flight and weapon system capabilities, make ISAFAP the only location where rapid deployment of all of these capabilities can be accomplished. As more UAVs become operational, other bases will likely be identified and separately evaluated for environmental consequences associated with operational squadron beddown decisions.

### **2.3.2 Simulator Training Only**

Many of the flight components and characteristics of the Predator aircraft can be, and are, simulated for training purposes. Simulator training enhances the skills of mission personnel involved in Predator operation. To be effective, simulator training must be integrated with actual operations, full system testing, mission capabilities, and weapons system evaluation. Operational and maintenance activities require real aircraft to equip personnel to face real world challenges. Simulator training only is not adequate to train for combat conditions faced in operating and maintaining Predator UAVs.

## 2.4 PERMIT REQUIREMENTS

This EA has been prepared in compliance with NEPA; other federal statutes, such as the Clean Air Act and the Clean Water Act; Executive Orders; and applicable state statutes and regulations. In addition, various federal, state, and local permits are required for certain construction and operational activities.

In accordance with the Nevada Administrative Code (Chapter 445A), a General Stormwater Permit for Construction from the Nevada Division of Environmental Protection, Bureau of Water Pollution Control is required for construction activities greater than 5 acres. In addition, a modification to the ISAFAF Stormwater General Discharge Permit would be required.

An Authority to Construct Permit from the Clark County Department of Air Quality Management would be required for facilities with boiler burners greater than 2 million BTU. Preliminary design for the Squad Operations and AMU hangar, the largest facility, indicates the burners would be slightly less than 1 million BTUs, therefore, this permit may not be required. As the design develops, and other facilities are designed, the facility requirements would be continually reviewed for changes that would require the necessary permits. Also, a Clark County Dust Control Permit would be required for all projects greater than 0.25 acre and any trenching greater than 100 linear feet.

In addition, the existing ISAFAF NPDES stormwater, NPDES wastewater, and the non-discharge (sludge disposal) permits will require modification due to the new construction.

## 2.5 COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This EA provides an analysis of the potential environmental consequences associated with the additional Predator beddown at ISAFAF. As indicated in Chapter 4.0, the proposed beddown would not result in significant impacts for any environmental resource. A comparative summary of the potential environmental consequences of the beddown alternatives and the No-Action Alternative is presented in Table 2-5.

**Table 2-5. Comparison of Alternatives by Environmental Resource**

<i>Environmental Resource</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>No Action</i>
Airspace Management and Use	NTTR: Increase of 7.5 Predator sorties per day or 45 flight hours R-2508: Increase of 3.1 Predator sorties per day or 15 flight hours; sorties scheduled with airspace managers	NTTR: Increase of 10.5 Predator sorties per day or 63 flight hours R-2508: Increase of 3.1 Predator sorties per day or 15 flight hours; sorties scheduled with airspace managers	NTTR: Increase of 0.7 Predator sorties per day or 4 flight hours R-2508: Increase of 0.1 Predator sorties per day or 1 flight hour; sorties scheduled with airspace managers	NTTR: Currently 4.2 Predator sorties per day or 25 flight hours R-2508: currently 0.7 Predator sorties per day or 4 flight hours; sorties scheduled with airspace managers
Safety	Class A mishap with no loss of life once every 1.2 months projected to improve as system matures; improved munitions storage for Hellfire increase from 50 to 140 per year; Hellfire shipments from Nellis AFB to ISAFAP to increase by up to five annually; runway extension and gate improvements benefit safety	Class A mishap with no loss of life once every 1.1 months projected to improve as system matures; improved munitions storage for Hellfire increase from 50 to 140 per year; Hellfire shipments from Nellis AFB to ISAFAP to increase by up to five annually; runway extension and gate improvements benefit safety	Class A mishap with no loss of life once every 3.2 months projected to improve as system matures; Hellfire increase from 50 to 100 per year; Hellfire shipments from Nellis AFB to ISAFAP to increase by up to three annually; runway extension improves safety; no gate improvements	Class A mishap with no loss of life once every 3.9 months projected to improve as system matures; two to three current Hellfire shipments
Noise	Increase less than 1 dB; no discernible change	Increase less than 1 dB; no discernible change	Increase less than 1 dB; no discernible change	No change from ISAFAP airfield operations
Air Quality	Total project operational emissions in tpy: CO: 127.2; SO <sub>2</sub> : 2.4; NO <sub>x</sub> : 38.2; PM <sub>10</sub> : 2.8; VOC: 6.9; construction PM <sub>10</sub> approximately 61 tpy for 4 years; no long-term impacts	Total project operational emissions in tpy: CO: 141.5; SO <sub>2</sub> : 3.2; NO <sub>x</sub> : 49.5; PM <sub>10</sub> : 3.7; VOC: 9.3; construction PM <sub>10</sub> approximately 61 tpy for 4 years; no long-term impacts	Total project operational emissions in tpy: CO: -105.5; SO <sub>2</sub> : 0.3; NO <sub>x</sub> : -4.9; PM <sub>10</sub> : -0.3; VOC: -12.3; construction PM <sub>10</sub> approximately 29 tpy for 3 years; no long-term impacts	Total current ISAFAP emissions in tpy: CO: 0.38; SO <sub>2</sub> : 1.0; NO <sub>x</sub> : 1.8; PM <sub>10</sub> : 13.5; VOC: 9.3

Table 2-5. Comparison of Alternatives by Environmental Resource

<i>Environmental Resource</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>No Action</i>
Water and Soils	Additional 8.6 AFY increase from 98.6 AFY currently used, which is within allocated water resources from state; infrastructure improvements to reduce soil erosion	Additional 12.2 AFY increase from 98.6 AFY currently used, which is within allocated water resources from state; infrastructure improvements to reduce soil erosion	Reduction of 47.7 AFY decrease from 98.6 AFY currently used, which is within allocated water resources from state; fewer infrastructure improvements; less area disturbed	Currently use 98.6 AFY, which is within available water allocation from the State; existing disturbed soils
Biological Resources	Procedures to avoid consequences to desert tortoise and burrowing owl incorporated into construction planning at Nellis AFB and ISAFAF	Procedures to avoid consequences to desert tortoise and burrowing owl incorporated into construction planning at Nellis AFB and ISAFAF	Procedures to avoid consequences to desert tortoise and burrowing owl incorporated into construction planning at ISAFAF; no construction at Nellis AFB; Alt. C disturbs one-half area of Alt. A or Alt B at ISAFAF	Procedures to avoid consequences to desert tortoise and burrowing owl in place
Cultural Resources	No significant archaeological, historical, or traditional resources recorded within area proposed for construction	No significant archaeological, historical, or traditional resources recorded within area proposed for construction	No significant archaeological, historical, or traditional resources recorded within area proposed for construction	Thirteen archaeology sites recorded at ISAFAF; all determined not eligible for inclusion in National Register.
Visual Resources	Construction in an open area on ISAFAF noticeable from Hwy 95; consistent with a military base	Construction in an open area on ISAFAF noticeable from Hwy 95; consistent with a military base	All visible construction within cantonment area; no discernible effects	ISAFAF is a small base completely visible from Highway 95

**Table 2-5. Comparison of Alternatives by Environmental Resource**

<i>Environmental Resource</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>No Action</i>
Land Use	New construction northeast of cantonment area consistent with ISAFAF planning policies, and guidelines; no expected incompatibilities with DNWR	New construction northeast of cantonment area consistent with ISAFAF planning policies, and guidelines; no expected incompatibilities with DNWR	All new construction in cantonment area consistent with ISAFAF planning policies and guidelines; no expected incompatibilities with DNWR	ISAFAF encompasses 2,830 acres of which 1,920 acres is designated open space, 227 acres are airfield, and the remainder is primarily base structures and paved areas
Socioeconomics	Peak year direct and indirect employment increase by 765 jobs; slightly positive but nearly indiscernible in dynamic Las Vegas area	Peak year direct and indirect employment increase by 859 jobs; slightly positive but nearly indiscernible in dynamic Las Vegas area	Peak year direct and indirect employment decrease by 560 jobs; slightly negative but nearly indiscernible in Las Vegas area	Workforce of 1,105 active duty military and 52 civilian contractors nearly all reside in the 1.5 million-population Las Vegas area
Environmental Justice	No effects expected in Indian Springs or Las Vegas area	No effects expected in Indian Springs or Las Vegas area	No effects expected in Indian Springs or Las Vegas area	Las Vegas area has an approximately 40.0 percent minority population with 10.8 percent of the total population below the poverty level
Infrastructure	Fire protection, communication, utilities, and electrical system improvements would benefit infrastructure	Fire protection, communication, utilities, and electrical system improvements would benefit infrastructure	No change	Fire protection adequate for airfield; needs improvements for cantonment area; police, communication, and utilities adequate; storm drainage and electrical considered inadequate or degraded

**Table 2-5. Comparison of Alternatives by Environmental Resource**

<i>Environmental Resource</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>No Action</i>
Transportation	Increase of peak hour traffic by 8.7 percent not expected to affect level of service; improvements to East Gate to benefit traffic flow	Increase of peak hour traffic by 12.3 percent not expected to affect level of service; improvements to East Gate to benefit traffic flow	Decrease of peak hour traffic by 50 percent not expected to affect level of service; no change to East Gate	Peak traffic volume is 337 vehicles per hour. Level of service considered good
Hazardous Materials and Waste Management	Existing 90-day hazardous waste Central Accumulation Site could accommodate increased hazardous materials use and waste generation; construction of northeast parking lot partially over LF-02 could be done under an ERP waiver and is not expected to impair parking lot use or landfill monitoring	Existing 90-day hazardous waste Central Accumulation Site could accommodate increased hazardous materials use and waste generation; construction of northeast parking lot partially over LF-02 could be done under an ERP waiver and is not expected to impair parking lot use or landfill monitoring	Existing 90-day hazardous waste Central Accumulation Site could accommodate hazardous materials use and waste generation; no parking lot near LF-02	Hazardous waste disposed through Defense Reutilization and Marketing Office contract

## 3.0 AFFECTED ENVIRONMENT

Environmental impact assessment is a three-step process. The first step in Chapter 2.0 describes the proposed action and alternatives. The second step is to describe in Chapter 3.0 the environmental setting where project actions could result in environmental effects. The third step is in Chapter 4.0 Chapter 3.0 describes the affected environment and focuses on those environmental resources potentially subject to impacts. For each resource, the expected geographic scope of potential impacts, known as the region of influence (ROI), is identified and the resource is defined before the existing conditions are discussed.

### 3.1 AIRSPACE MANAGEMENT AND USE

The ROI for airspace management and use includes the airspace areas in which the Predator would fly. These are the NTTR airspace in Nevada including the Desert and Reveille MOAs, the R-2508 Range Complex in California, the Utah Test and Training Range (UTTR) in Utah, and Class A airspace between NTTR and the R-2508 Complex and between NTTR and the UTTR.

#### 3.1.1 Definition of the Resource

Airspace management is defined as the direction, control, and handling of flight operations in the volume of air that overlies the geopolitical borders of the United States and its territories. Airspace is a resource managed by the Federal Aviation Administration (FAA), which has established policies, designations, and flight rules to protect aircraft in the airfield and enroute environment, in Special Use Airspace areas identified for military and other governmental activities, and other military training airspace. Management of this resource considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. Because of these multiple and sometimes competing demands, the FAA considers all aviation airspace requirements in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System (NAS) can best be structured to satisfy all user requirements.

The FAA has designated four types of airspace above the United States: Controlled, Special Use, Other, and Uncontrolled airspace. These are defined as follows:

- Controlled airspace has defined dimensions within which air traffic control service is provided to pilots operating aircraft under Instrument Flight Rules (IFR), and to Visual Flight Rule (VFR) flights in accordance with the airspace classification. Controlled airspace has five classifications: Class A, Class B, Class C, Class D, and Class E. These classes identify airspace that is controlled, airspace supporting airport operations, and designated airways affording enroute transit from place-to-place. The classes also dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.
- Special Use Airspace (SUA) is reserved for flight operations that require confinement of participating aircraft, or place operating limitations on non-participating aircraft. Restricted Areas and Military Operations Areas (MOAs) are examples of SUA.

- Other airspace consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), and Aerial Refueling Tracks (ARs). This category also includes Air Traffic Control Assigned Airspace (ATCAA). When not required for other needs, ATCAA is airspace authorized for military use by the managing Air Route Traffic Control Center (ARTCC), usually to extend the vertical boundary of SUA.
- Uncontrolled airspace is designated Class G airspace and has no specific prohibitions associated with its use.

#### 3.1.2 Existing Conditions

Predator operations are conducted in Restricted Areas, Military Operations Areas (MOAs), Class A, and Class D airspace using a C-Band for line-of-sight or Ku-Band for beyond line-of-sight communication data links. A Restricted Area is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. Entry into a Restricted Area without approval from the using or controlling agency is prohibited. A MOA is airspace established outside Class A airspace to separate or segregate certain non-hazardous military activities from Instrument Flight Rules (IFR) traffic and to identify for Visual Flight Rules (VFR) traffic where these activities are conducted. In general, Class A airspace is that airspace from 18,000 feet above mean sea level (MSL) up to and including Flight Level (FL) 600 (approximately 60,000 feet MSL). Airspace within a 5-mile radius of ISAFAP that is not restricted is Class D airspace. Within Class A airspace, unless otherwise authorized, pilots must operate their aircraft under IFR with an appropriate Air Traffic Control (ATC) clearance.

ISAFAP is situated along and within the southern lateral boundary of the restricted airspace R-4806W. This southern lateral boundary of the airspace also coincides with the southern border of the NTTR, as shown on Figure 3.1-1. A small airfield at the Nevada Test Site, called Desert Rock Airport, is located approximately 17.5 nautical miles (nm) west of ISAFAP. Nellis AFB is located approximately 38 nm southeast of ISAFAP.

Since ISAFAP is located within R-4806W, all Predator launches occur within SUA. Most Predator training sorties would be flown in the southern portions of the NTTR (South Range) within R-4806W. The NTTR North Range and Desert and Reville MOAs are also used. Predator sorties flown in the Desert and Reville MOAs are allowed only under Visual Meteorological Conditions, and the aircraft may not enter cloud formations. Flight safety must be equal to, or greater than, that afforded by a chase aircraft accompanying the unmanned aircraft. The Air Force is required to post special notices within the Airport/Facility Direction for the southwest United States documenting the area planned for use, the UAV operation, the altitudes intended for use, and the time of the intended operation. If the time is not known, continuous use will be indicated. Predator sorties may not occur when the airspace has been released to the FAA. Under current levels of activity, 1,080 Predator sorties are flown annually in the NTTR airspace.

Predator training also occurs in the R-2508 Range Complex in California, which includes Edwards AFB, China Lake, and Fort Irwin airspace as shown on Figure 3.1-2. Predator aircraft are launched from ISAFAP and fly to the R-2508 Range Complex, which is approximately 80 nm southwest of ISAFAP. Flight outside of Restricted Areas is performed in Class A airspace, along

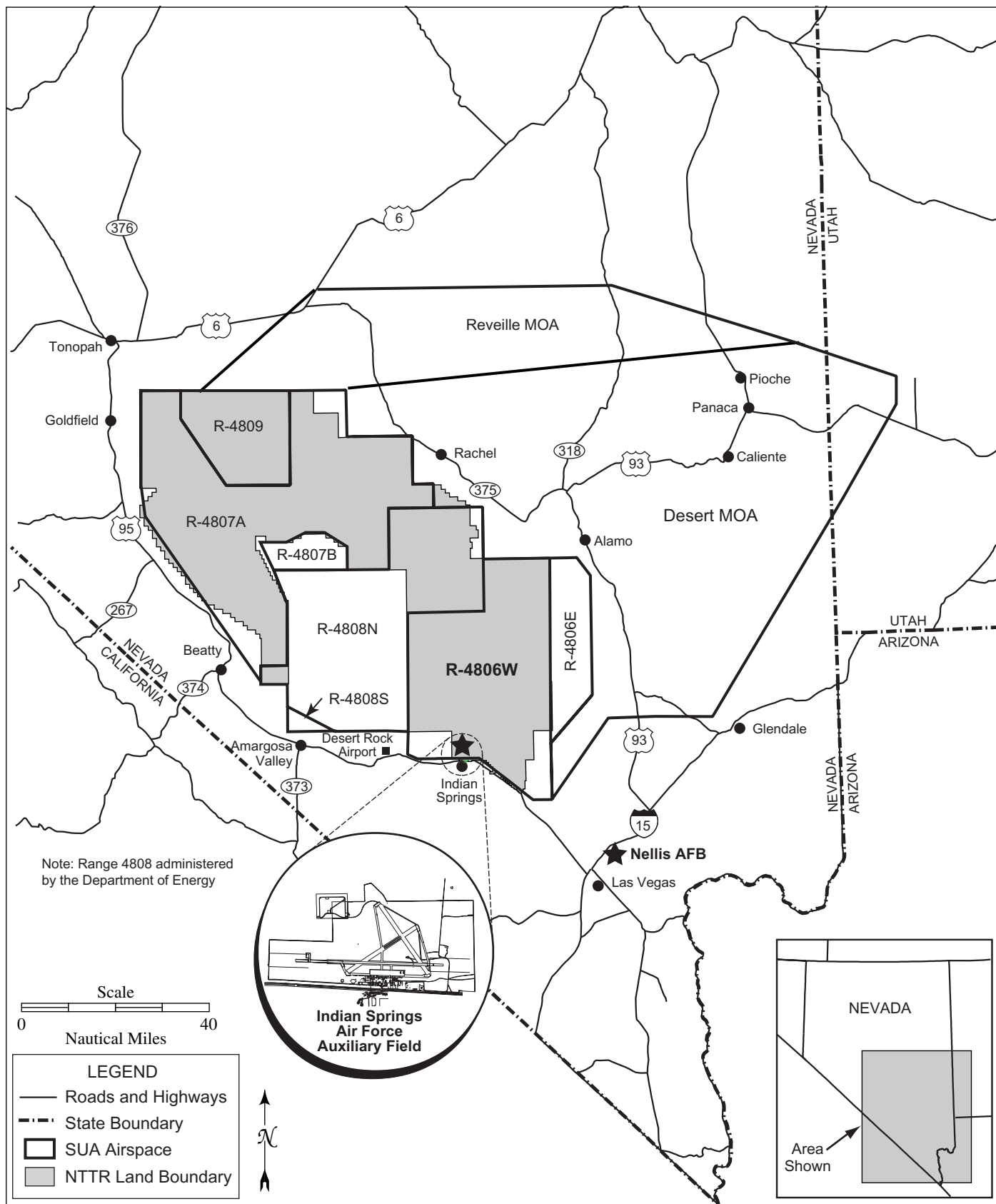
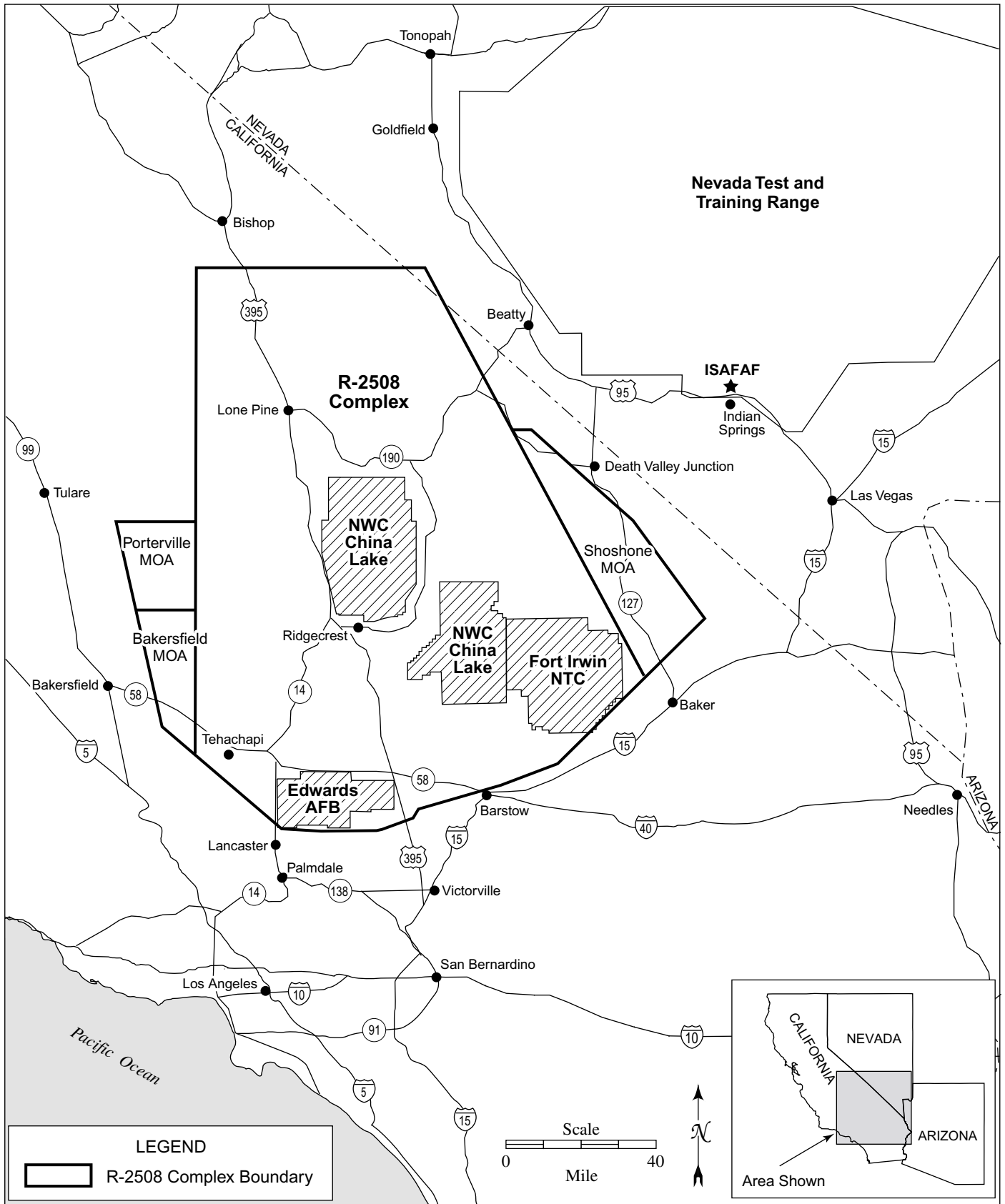


Figure 3.1-1. Nevada Test and Training Range Airspace



**Figure 3.1-2. R-2508 Range Complex Airspace**

routes that have been coordinated with the FAA and documented in a Certificate of Authorization (COA). All flight in Class A airspace is accomplished under IFR, and flight plans are coordinated and filed with the Los Angeles and/or Salt Lake City ARTCC three days in advance of the flight. Predators also have COAs to use other nearby ranges, including the UTTR. Flight between ISAFAF and the UTTR is conducted under a COA using the same procedures described for flight between ISAFAF and the R-2508 Range Complex.

The Predator aircraft are equipped with a transponder that enables tracking by the ARTCC; and they have the ability to “squawk” a specific code to the ARTCC and the ground station should a malfunction occur during flight. The designated routes avoid all military and commercial routes (personal communication, Callahan, 2003). Under current levels of activity, 174 Predator sorties are flown annually in R-2508.

## **3.2 SAFETY**

The ROI for safety in this EA includes ISAFAF, the NTTR, R-2508, and specific segments of Class A airspace providing transit between the two airspaces. Restricted Area R-4806 supports the majority of Predator training activities in the NTTR.

### **3.2.1 Definition of the Resource**

This section addresses ground, explosive, and flight safety associated with operations involving the Predator UAV conducted from ISAFAF, Nevada. Ground safety considers issues associated with operations and maintenance activities that support base operations, including fire and crash response. Explosive safety considers the management and use of ordnance or munitions associated with airbase operations and training activities. Flight safety considers aircraft flight risks such as aircraft accidents and bird-aircraft strikes.

### **3.2.2 Existing Conditions**

#### ***3.2.2.1 Ground Safety***

Day-to-day operations and maintenance activities conducted at ISAFAF are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements.

The fire department at ISAFAF is fully capable of responding to aircraft accidents. However, on the installation, fire protection systems are degraded for Life Safety Code deficiencies at the Visiting Officer and Airman Quarters, the Theater, the Recreation Center, and a hangar without fire suppression systems (USAF 2003). The Air Force and the community of Indian Springs are party to mutual support fire suppression agreements (USAF 2003).

Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design Criteria*, limits locations and heights of objects and facilities around and in the immediate vicinity of an airfield to minimize hazards to airfield and flight operations. Any condition not meeting these requirements is classified as an approved waiver, a permissible deviation, an exemption, or a violation (UFC 3-260-01). ISAFAF has 15 Headquarters Air Combat Command-approved

installation facilities and/or associated obstruction waivers, 14 deviations, and nine exemptions (USAF 2003).

#### 3.2.2.2 *Explosives Safety*

Ordnance is handled and stored in accordance with Air Force explosive safety directives (Air Force Instruction [AFI] 91-201), and all munitions maintenance is carried out by trained, qualified personnel using Air Force-approved technical data.

Safety clearance zones protect areas where munitions are stored, maintained, and handled. These zones are geographically defined as Quantity-Distance (Q-D) arcs, and are based on the types and amounts of explosive material involved. On ISAFAF, no encroachment into these safety areas currently occurs (USAF 2003).

The armament carried by the Predator is the AGM-114 "Hellfire" air-to-ground missile. Currently, all storage and maintenance associated with this weapon system is accomplished in the weapon storage area (WSA) on Nellis AFB. When used in conjunction with Predator operations, this ordnance is transported, over approved transportation corridors (public road network) to ISAFAF. While the facilities on Nellis AFB are certified in all storage and maintenance requirements for this ordnance, they often operate at, or near capacity due to the large volume of other ordnance they must manage to support other requirements at Nellis AFB.

#### 3.2.2.3 *Flight Safety*

The primary public concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with manmade structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird-aircraft strikes.

##### *Aircraft Mishaps*

The Air Force defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of \$1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than \$200,000, but less than \$1 million, result in permanent partial disability or inpatient hospitalization of three or more personnel, but do not result in fatalities. Class C mishaps involve reportable damage of more than \$20,000, but less than \$200,000, or a lost workday involving 8 hours or more away from work beyond the day or shift on which it occurred; or occupational illness that causes loss of work at any time. HAP represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and HAP, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public (USAF 2001a AFI 91-204). This EA focuses on Class A mishaps because of their potentially catastrophic results.

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The probability of an

aircraft crashing into a populated area is extremely low, however it cannot be totally discounted. Several factors are relevant: the ROI and immediate surrounding areas have relatively low population densities; the coordinated and designated aircraft routes avoid direct overflight of population centers; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleum, oils, and lubricants not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils determines how rapidly contaminants are absorbed. The specific geologic structure in the region determines the extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area would also affect the extent of contamination of those resources.

Based on historical data on mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. It should be noted that these mishap rates do not consider combat losses due to enemy action. The Class A mishap rate per 100,000 flying hours can be used to compute a statistical projection of anticipated time between Class A mishaps. In evaluating this information, it should be emphasized that those data presented are only statistically predictive. The actual causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

Since its introduction into reconnaissance support for battlefield commanders (1997), until 2002, the Predator (RQ-1) has flown approximately 31,503 hours. During that time, the aircraft has been involved in 13 Class A mishaps, which include 12 aircraft destroyed (AFSC 2003). This equates to a Class A mishap rate per 100,000 flying hours of 41.27, or one Class A mishap for every 2,423 hours flown. Analogous rates for aircraft destroyed reflect a rate of 38.09 per 100,000 flying hours, or one aircraft destroyed for every 2,625 hours flown (AFSC 2003).

A unique aspect of Predator flying operations is that the aircraft is unmanned. This means that a Predator Class A mishap has no risk to aircrew. The pilot flies the aircraft via a data-link from a ground control station. In flight, if malfunctions occur and the data-link is lost, the aircraft is programmed to return to a predetermined area within the Restricted Airspace on Nellis range. Then, it orbits while attempts are made to restore the data-link. If all fails, the aircraft simply orbits until fuel exhaustion. However, the orbit location is such that there is little or no risk to persons on the ground.

#### *Bird-Aircraft Strike Hazards*

Bird-aircraft strike hazards constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. Aircraft occasionally encounter birds at altitudes of 30,000 feet MSL or higher. However,

most birds fly close to the ground. Over 97 percent of reported bird strikes occur below 3,000 feet above ground level (AGL). Approximately 30 percent of bird strikes happen in the airport environment, and almost 55 percent occur during low-altitude flight training (AFSC 2002).

The potential for bird-aircraft strikes is greatest in bird migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, and wetlands). Migratory waterfowl (e.g., ducks, geese, and swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. Raptors and vultures also pose a strike hazard.

The bird-aircraft strike risk in the vicinity of Nellis AFB and ISAFAP is considered minor. Exposure to risk is generally limited to resident species, which exhibit generally small populations. Because of the generally inhospitable habitat in the region, few migratory species appear in the area. Sunrise Mountain and Frenchman's Peak shield the area from Lake Mead, the greatest wildlife attractant in the area (USAF 2003).

The Nellis flying safety office receives an average of fewer than 20 bird strike reports each year. Considering the level of aviation activity occurring at Nellis AFB and on the NTTR, this indicates very low risk associated with bird-aircraft strikes (USAF 2003)

## 3.3 NOISE

The ROI for noise includes ISAFAP and the town of Indian Springs.

### 3.3.1 Definition of the Resource

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although exposure to very high noise levels can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual.

### 3.3.2 Existing Conditions

Noise is perhaps the most identifiable concern associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is often singled out for special attention and criticism. The description of the existing noise environment projected to occur from the proposed changes and in the use of Restricted Areas requires a general understanding of sound measurement and the effects of noise on humans, animals, and structures. The following is a summary of the significant information needed to understand the information contained in this section.

In this EA, aircraft noise levels are quantified using the Day-Night Average Sound Level (Ldn). The Ldn (alternatively denoted DNL) is a cumulative metric that accounts for the total sound energy of all aircraft noise events over a 24-hour period with sound levels of nighttime (2200 to 0700 hours) noise events emphasized by adding a 10 dB weighting. The 10 dB weighting accounts for the lower ambient sound levels and greater community sensitivity to noise during

nighttime hours. When aircraft fly at low altitudes, a receptor on the ground can experience a “startle effect” because of the rapid onset of noise levels. For this reason, models that calculate noise levels for military airspace include an onset rate penalty of up to 11 dB. Such onset rate adjusted Ldn values are designated as Ldnmr.

### ***ISAFAF Vicinity***

Analysis of existing aircraft noise exposure and compatible land uses around ISAFAF was accomplished using the NOISEMAP suite of computer programs. The existing operating characteristics of ISAFAF were used with the NOISEMAP model to simulate the propagation of noise in the vicinity, and to develop noise contours. In addition to the operating data for ISAFAF presented in Chapter 2.0, aircraft approaches, departures, and closed pattern operations were assigned appropriate flight tracks, power applications, altitudes, and speeds. Consistent with the requirements of the DNL metric, all operations between 2200 and 0700 hours were assigned a 10 dB penalty to reflect heightened sensitivity during that time period. The resulting noise contours, which cover the range of noise level from 85 to 65 DNL in 5 dB increments, are presented in Table 3.3-1 along with the total area within each contour.

The Nellis-based Thunderbirds demonstration team uses ISAFAF for training and practice. ISAFAF is also used as a field for realistic military training during Flag and other exercises. Thus, the current noise environment at the airfield is dominated by F-15 and F-16 aircraft, which average 0.15 and 0.46 operations per day. Although these operating levels are quite low, they are equivalent in noise to over 600 Predator operations per day due to the dominant noise characteristics of these turbofan-powered aircraft.

**Table 3.3-1. Areas within the 65 to 85 DNL Noise Contours**

<i>DNL Contour Value</i>	<i>Area in Square Miles.</i>
65	0.7
70	0.5
75	0.0
80	0.0
85	0.0

### ***Range and Vicinity***

The existing noise environment has been characterized on the basis of the sound level versus distance characteristics of the Predator aircraft (composite one-engine general aviation aircraft), consistent with the methodology used in assessing the airfield.

The sound exposure level (SEL) of the Predator is compared with the SEL of an F-15A aircraft in Figure 3.3.1. The graph depicts distances ranging from 200 feet to over 20,000 feet. Distances are described as the “slant range”, which is the diagonal distance from the aircraft in the air to the observer on the ground. As depicted, the Predator SEL values are 23 to 32 dB lower than the F-15A, depending on the distance. The SEL values converge as distance increases, because there is higher atmospheric absorption for the F-15A emissions, which have a higher frequency content.

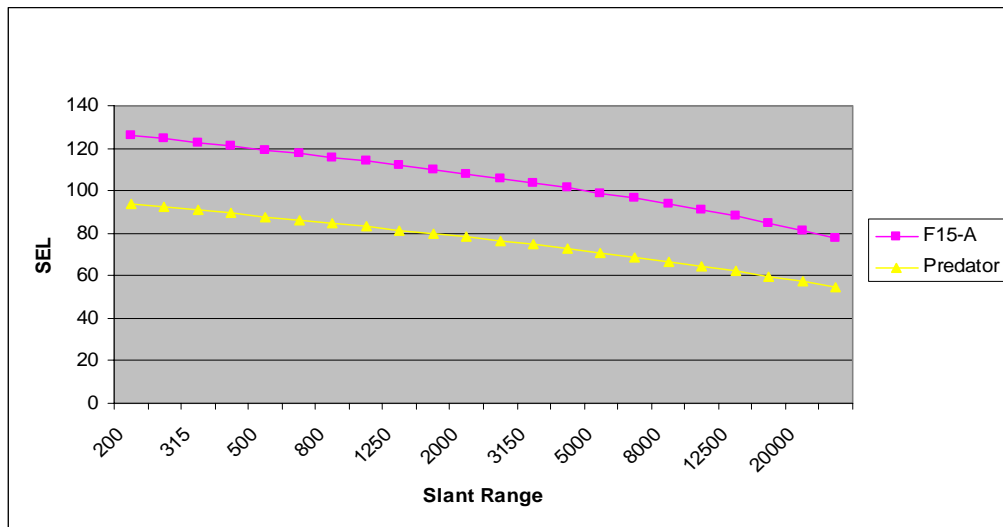


Figure 3.3-1. F-15A and Predator Noise Levels

### 3.4 AIR QUALITY

The ROI for air quality includes the NTTR airspace where most of the construction would occur and where Predator flights would originate and be concentrated; the R-2508 airspace (above the mixing layer) north of Edwards AFB in California, where the Predator flights would occur; and the area around Nellis AFB where three munitions storage structures would be constructed.

#### 3.4.1 Definition of the Resource

Air quality is defined in a regulatory sense in terms of attainment status relative to national and state standards and other factors, as described below.

##### *National Ambient Air Quality Standards*

Air quality is determined by the type and concentration of pollutants in the atmosphere, size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (USEPA) has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS), represent maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb).

The NAAQS are defined in terms of concentration (e.g., parts per million [ppm] or micrograms per cubic meter [ $\mu\text{g}/\text{m}^3$ ]) determined over various periods of time (averaging periods). Short-term standards (1-hour, 8-hour, or 24-hour periods) were established for pollutants with acute health effects and may not be exceeded more than once a year. Long-term standards (annual periods) were established for pollutants with chronic health effects and may never be exceeded.

In 1997, the USEPA promulgated two new standards: a new 8-hour O<sub>3</sub> standard (which will eventually replace the existing 1-hour O<sub>3</sub> standard) and a new standard for particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), which are fine particulates that have not been previously regulated. In addition, the USEPA revised the existing PM<sub>10</sub> standard. The two new standards are scheduled for implementation over the next few years, as monitoring data becomes available to determine the attainment status of areas in the United States. Meanwhile, the USEPA will enforce the existing 1-hour O<sub>3</sub> standard for areas that are still in nonattainment of the standard.

### *State and County Air Quality Standards*

Under the CAA, state and local agencies may establish ambient air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements. ISAFAF is under the local jurisdiction of Clark County Department of Air Quality Management (DAQM), the regulatory and enforcement agency in Clark County, Nevada. For the criteria pollutants of concern, Clark County AAQS are the same as the federal standards with the exception of SO<sub>2</sub> primary standards, which are more stringent than the federal. The federal and Nevada primary standards associated with criteria pollutants are summarized in Table 3.4-1.

**Table 3.4-1. National and State Ambient Air Quality Standards**

<i>Pollutant</i>	<i>Averaging Time</i>	FEDERAL NAAQS		NEVADA NAAQS
		<i>Primary</i>	<i>Secondary</i>	<i>Primary</i>
Carbon Monoxide (CO)	8-Hour 1-Hour	9 ppm 35 ppm	-- --	9 ppm 35 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	AAM	0.053 ppm	0.053 ppm	0.053 ppm
Sulfur Dioxide (SO <sub>2</sub> )	AAM 24-Hour 3-Hour	0.03 ppm 0.14 ppm --	-- -- 0.5 ppm	0.02 ppm 0.1 ppm --
Particulate Matter (PM <sub>10</sub> )	AAM 24-Hour	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> ) <sup>(a)</sup>	AAM 24-Hour	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>
Ozone (O <sub>3</sub> ) <sup>(b)</sup>	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.12 ppm --	0.12 ppm 0.08 ppm
Lead (Pb) and Pb Compounds	Calendar Quarter	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>
Notes: AAM = Annual Arithmetic Mean ppm = parts per million µg/m <sup>3</sup> = micrograms per cubic meter (a) The PM <sub>2.5</sub> standard (particulate matter with a 2.5 micron diameter) was promulgated in 1997, and will be implemented over an extended time frame. Areas will not be designated as in attainment or nonattainment of the PM <sub>2.5</sub> standard until the 2002 – 2005 timeframe. (b) The 8-hour ozone standard was promulgated in 1997, and will eventually replace the 1-hour standard. The USEPA plans to implement this standard beginning in 2004. During the interim, the 1-hour ozone standard will continue to apply to areas not attaining it.				

#### ***Attainment Areas***

The USEPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment areas) or worse than the NAAQS (nonattainment areas). Nonattainment areas that achieve attainment are subsequently redesignated as maintenance areas for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when insufficient ambient air quality data exists for the USEPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS. The CAA Amendments (CAAA) of 1990 established a framework to achieve attainment and maintenance of the health-protective NAAQS. Title I sets provisions for the attainment and maintenance of the NAAQS.

#### ***State Implementation Plan***

The CAA of 1977 set provisions for attainment and maintenance of the NAAQS. For non-attainment regions, states are required to establish a State Implementation Plan (SIP) designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring state air quality conditions into (and maintain) compliance with the NAAQS by specific deadlines. This plan is to be prepared by local agencies and incorporated into the overall SIP for each state.

The CAAA of 1990 established new federal nonattainment classifications, new emission control requirements, and new compliance dates for nonattainment areas. The requirements and compliance dates are based on the severity of nonattainment classification.

#### ***Prevention of Significant Deterioration***

Section 162 of the CAA further established the goal of prevention of significant deterioration (PSD) of air quality in all international parks; national parks which exceeded 6,000 acres; and national wilderness areas which exceeded 5,000 acres if these areas were in existence on August 7, 1977. These areas were defined as mandatory Class I areas, while all other attainment or unclassifiable areas were defined as Class II areas. Under CAA Section 164, states or tribal nations, in addition to the federal government, have the authority to redesignate certain areas as (non-mandatory) PSD Class I areas, *i.e.*, a National Park or national wilderness area established after August 7, 1977, which exceeds 10,000 acres. PSD Class I areas are areas where any appreciable deterioration of air quality is considered significant. Class II areas are those where moderate, well-controlled growth could be permitted. Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have yet been so designated. The PSD requirements affect construction of new major stationary sources in the PSD Class I, II, and III areas.

#### ***Visibility***

CAA Section 169A established the additional goal of prevention of further visibility impairment in the PSD Class I areas. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area is typically associated with evaluation of stationary source contributions. The USEPA is implementing a Regional Haze rule for PSD Class I areas that will address

contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to qualitatively assess potential impairment to visibility in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of PM<sub>10</sub> and SO<sub>2</sub> in the lower atmosphere.

### ***General Conformity***

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies to demonstrate conformity of proposed activities with the local SIP. In 1993, the USEPA issued final rules for determining air quality conformity. Federal activities must not:

- (a) cause or contribute to any new violation;
- (b) increase the frequency or severity of any existing violation; or
- (c) delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS.

General conformity applies only to nonattainment and maintenance areas. If emissions from a federal action proposed in a nonattainment area would exceed annual thresholds identified in the rule, a conformity determination is required of that action. The thresholds become more restrictive as the severity of the nonattainment status of the region increases (70 tons per year of PM<sub>10</sub> or 100 tons per year of CO for CO and PM<sub>10</sub> serious nonattainment areas).

## **3.4.2 Existing Conditions**

### ***3.4.2.1 Climate and Meteorology***

ISAFAP and Nellis AFB are located in southern Nevada, between the Sierra Nevada Mountains of California and the Springs Mountains immediately west of the Las Vegas Valley. The climate is characterized by hot and dry summers and mild winters. The summer heat is tempered somewhat by the extremely low relative humidity. However, occasional moist winds from the south, typically during the months of July and August, bring spectacular desert thunderstorms that are frequently associated with significant flash flooding and/or strong downburst winds. Daily high temperatures in the summer typically exceed 100 degrees with lows in the 70s.

Winters are generally mild and pleasant. Afternoon temperatures average near 60 degrees and skies are mostly clear. Pacific storms occasionally produce rainfall in Las Vegas, but in general the mountains on the east and west of Las Vegas Valley act as effective barriers to moisture. The average annual precipitation is 4.13 inches. Snow accumulation is normally rare in the Las Vegas area. Flurries are observed once or twice during most winters, but snowfall of 1 inch or more occurs only once every 4 to 5 years.

The spring and fall seasons are generally considered ideal. Although some sharp temperature changes can occur during these months, outdoor activities are seldom hampered.

Strong winds are the most persistent weather hazard in the area. Winds can occasionally reach over 50 miles per hour with some of the more vigorous storms. Winter and springs winds often generate widespread areas of blowing dust and sand. Strong winds in the summer are usually

associated with thunderstorms, and are thus more isolated and localized. Prevailing wind direction is typically southwest, unless associated with a thunderstorm outflow.

#### 3.4.2.2 Regional Air Quality

ISAFAF is located in the northwestern portion of Clark County, in Southern Nevada. Nellis AFB is located in central Clark County, just northeast of Las Vegas. The Clark County Department of Air Quality Management is the regulatory and enforcement agency in Clark County, Nevada. A major portion of Clark County, the Las Vegas Valley hydrographic area, is designated as "serious" nonattainment for CO and PM<sub>10</sub>, and attainment or meeting national standards for the remaining criteria pollutants, including NO<sub>2</sub>, SO<sub>2</sub>, O<sub>3</sub>, and Pb. Nellis AFB is located in the serious nonattainment area of Clark County, while ISAFAF is located just outside of it. Figure 3.4-1 illustrates the relationship of the Clark County CO and PM<sub>10</sub> nonattainment area to the NTTR airspace. Based on recent monitoring data, Clark County is expected to be designated as a nonattainment area for the new 8-hour ozone standard when the EPA makes its designations, which is expected to occur in 2004.

Mandatory PSD Class I areas established under the CAAA of 1977 for the state of Nevada are listed in 40 CFR 81.418. These are areas where visibility has been determined to be an important issue by the Administrator, in consultation with the Secretary of the Interior. The nearest mandatory PSD Class I area to the region potentially affected by the action alternatives is the Grand Canyon National Park, located in Arizona, approximately 100 miles east of ISAFAF.

For the R-2508 airspace, all flights would occur above the mixing layer; hence, the air basins beneath the mixing layer are not part of the ROI, and the ground-level air quality would not be affected by Predator flights above the mixing layer.

#### 3.4.2.3 Current Air Emissions

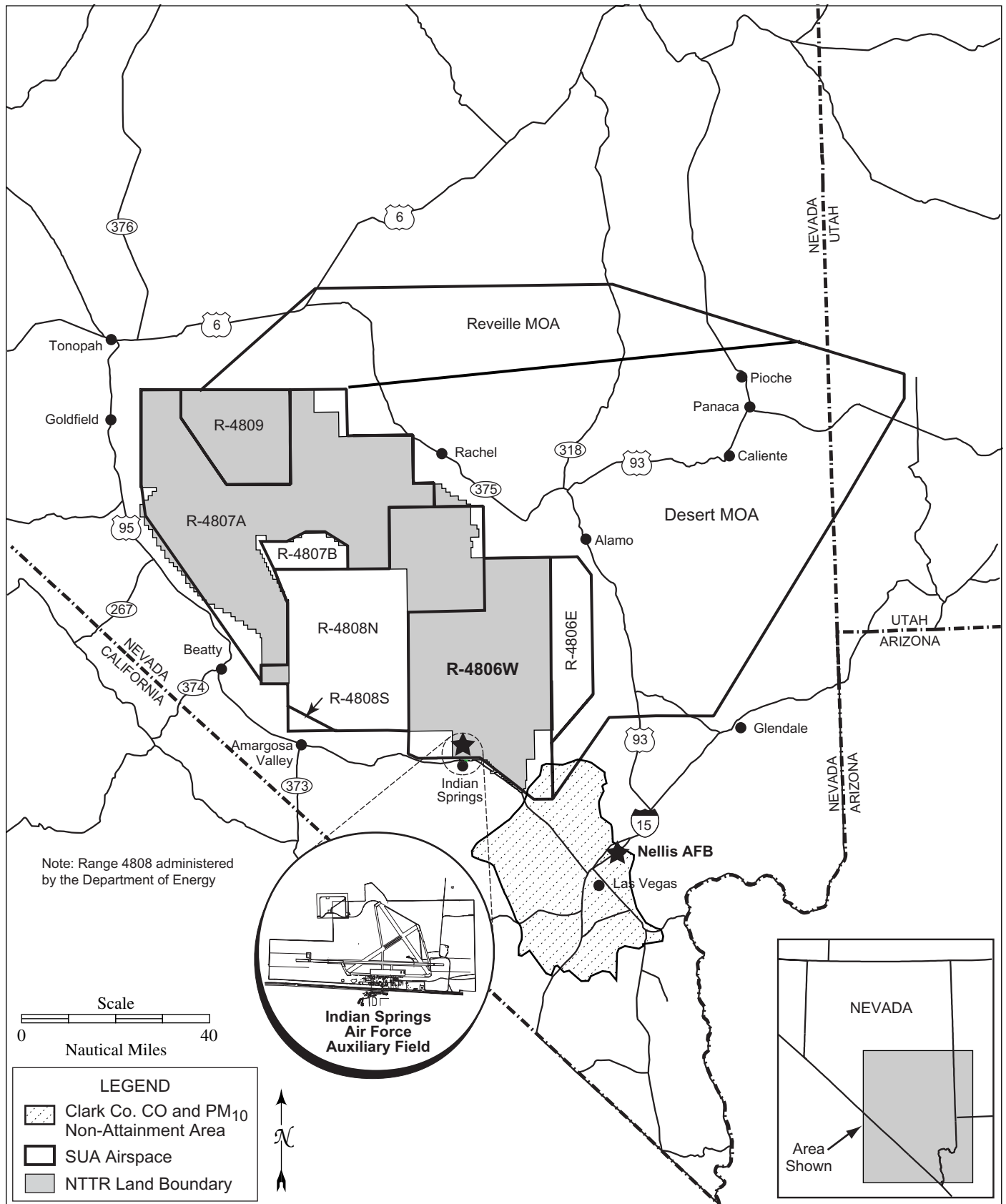
Current ground-level air emissions at ISAFAF and Nellis AFB are from mobile and stationary sources. The mobile sources include aircraft operations, ground support equipment, and motor vehicles. Examples of stationary sources include boilers, emergency generators, military gas stations, rock crushing operations, and surface coating operations. The 2002 air emissions inventory for stationary sources at ISAFAF and Nellis AFB is summarized in Table 3.4-2.

**Table 3.4-2. 2002 Emissions Inventory for Stationary Sources (in tons per year)**

<i>Location</i>	<i>CO</i>	<i>SO<sub>x</sub></i>	<i>NO<sub>x</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
ISAFAF	0.38	1.01	1.78	13.54	9.28
Nellis AFB	24.67	4.36	31.47	36.66	13.67
Sources: Nellis AFB Environmental Management 2003a and 2003b					

## 3.5 GEOLOGY AND SOIL

The ROI for geology and soil includes the sites and immediate vicinities where construction or ground disturbance would occur as a result of project-related actions.



**Figure 3.4-1. Relationship of Clark County CO and PM<sub>10</sub> Nonattainment Area to the NTTR Airspace**

#### 3.5.1 Definition of the Resource

Geologic resources refer to earth processes or elements that could be potentially affected by the proposed project and include geology, topography, seismicity, and soils. This section describes the geological resources present on and in the vicinity of ISAFAF. Additionally, a discussion of geologic resources at the Nellis MSA site is included.

#### 3.5.2 Existing Conditions

##### *Geology and Topography*

ISAFAF is located within the southern part of the Great Basin, the northernmost subprovince of the Basin and Range Physiographic Province (Hunt 1974). The Great Basin is characterized by steep, north-trending mountain ranges that are separated by vast alluvial basins. The entire region, including the project area, generally drains internally, and has no surface water outlet (USAF 1999).

Elevations in the vicinity of ISAFAF range from approximately 3,000 feet (914 meters), in the Indian Springs and Three Lakes Valleys, to over 6,000 feet (1,829 meters), in the Pintwater and Spotted Ranges (USAF 1999). The topography of the region is typical of the Great Basin and can be described as high, thin mountain ranges with alluvial basins in between. The ranges are comprised of block-faulted mountains formed by massive Paleozoic carbonate rocks that rise abruptly from flanking bajadas (coalescing alluvial fans) (USAF 1999). The valleys are deep alluvial basins with source material originating from adjacent ranges (Pintwater and Spotted ranges). Desert playas (dry lakebeds) are also present throughout the region.

ISAFAF is located in the southern opening of the Indian Springs Valley. The valley is bound by the Spotted Range and Buried Hills to the west and the Pintwater Range to the east. The valley areas are dominated by Quaternary alluvial deposits with patches of Quaternary playa and marsh deposits north of ISAFAF. The local mountains (southern Pintwater Range and Spotted Range) are primarily Paleozoic limestone, dolomite, shale, and quartzite (USAF 1999). Due primarily to the western winds, the western sides of the mountains in the area are commonly flanked by dunes on top of deep alluvial fans (USAF 1999).

No known faults underlie ISAFAF, and the majority of the faults in the vicinity are considered inactive. The only known active fault in the area is the Yucca fault, located approximately 20 miles northwest at the southern border of North Range. The Yucca fault is considered active based on displacement of Holocene and Pleistocene alluvium by as much as 60 feet. Offsets of such young deposits are indicative of fault movement within the last few thousand to tens of thousands of years. Subsurface displacement along this fault has been determined to be approximately 700 feet (USAF 1999). Inactive or potentially active faults in the area include the Pahrnagat fault (approximately 20 miles northeast), which displays Quaternary fault movement (during the past 2 million years).

ISAFAF is located within Seismic Zone 2B, as identified in the Uniform Building Code (ICBO 1991). Zone 2B, on a scale of 1 to 4, is defined as an area of moderate damage potential. Current design standards require facilities to be built to Seismic Zone 4 standards (USAF 1999).

An area in the northwest corner of ISAFAF is located within a 100-year flood plain (Zone II, T-2). Areas within the 100-year floodplain are defined as having a 1 percent chance of being inundated by floodwaters for any given year.

At the Nellis MSA site, topography consists of both gently and sharply inclined hills. The site is dominated by Quaternary alluvium with angular volcanic rock fragments intermixed. The area is generally undisturbed with the exception of munitions storage facilities to the north and Perimeter Road to the south.

The nearest faults to the Nellis MSA site are the California Wash fault zone, located approximately 10 to 30 miles (16 to 48 km) to the northeast, and the Eglington fault, located approximately 15 miles (24) to the west. The United States Geological Survey (USGS) identifies the California Wash fault as capable of producing a magnitude 7.0 earthquake on the Richter scale and the Eglington fault as capable of producing a magnitude 6.3 earthquake (USGS 2001).

### ***Soils***

Soils in the vicinity of ISAFAF have not been mapped in detail. Soil information for the area is based on general descriptions from various resource surveys, geologic studies in adjacent areas, and general observations. A geotechnical report will be prepared for ISAFAF as part of the pre-construction planning and design phase. The following summary of soils in the vicinity of ISAFAF is based on the aforementioned reports and observations.

Soils in the area are aridisols developed in carbonate parent material from local mountains (USAF 1999). Aridisols generally have poorly developed A horizons with clear B and C horizons and are sandy, loose, and prone to erosion in areas not protected by desert pavement. Soils can form anywhere that sediments accumulate; however, soils develop very slowly in desert environments and are easily disturbed. Much of the area has a surface crust known as desert pavement, which is an armored surface crust of packed angular to sub-rounded rock fragments covering the soils surface. Desert pavement is common to arid environments and acts as a shell to softer, more vulnerable soils below. Lenses of caliche (sediment cemented together with sodium salts) and clay are also known to be present at depth (USACE 2003).

Soils at the Nellis MSA site are predominately well-drained, undisturbed sandy loam with intermixed Tertiary volcanic angular fragments.

## **3.6 WATER RESOURCES**

The ROI for water resources includes surface and groundwater resources within the near vicinity of ISAFAF.

### **3.6.1 Definition of the Resource**

Water resources include surface and groundwater, as well as characteristics of the water supply system of ISAFAF.

### 3.6.2 Existing Conditions

#### *Surface Water*

Natural surface water is scarce on and around ISAFAF. The dry desert regional climate of the area is characterized by low precipitation and humidity, high evaporation, and wide extremes in daily temperatures (USAF 1999). Average annual precipitation at ISAFAF is approximately 4 inches; however, the area is susceptible to locally intense thunderstorms that can produce flash floods. Flash floods produce high peak flows over short periods of time.

Most of the surrounding area drains internally, i.e., surface water runoff does not ultimately flow to the ocean. Surface flow is primarily towards the two local playas, located north of the Air Field where it collects and evaporates. Playas are not substantial recharge zones due to low infiltration and high evaporation rates. Evaporation rates in the area are very high and have been estimated at approximately 58 to 69 inches per year (USAF 1999).

Other than constructed ponds and structures, no permanent surface water occurs on or in the vicinity of ISAFAF. Surface water in the vicinity of ISAFAF flows through braided, ephemeral streams, which usually flow for brief periods immediately following precipitation events.

#### *Groundwater/Water Supply*

Potable water is supplied to ISAFAF from three active wells located within the Air Field boundaries (Well 62-1, Well 106-2, and ISAFAF Well 3). Pumped groundwater is chlorine-treated before entering the base distribution system (USAF 1998). The Air Force has authorization from the State of Nevada Engineer to pump a total of approximately 193 acre-feet per year (AFY) or 62.7 million gallons per year (gpy) from these wells. Specific annual allocations for each well are presented in Table 3.6-1.

**Table 3.6-1. Annual Allocations for ISAFAF Wells**

<i>Well</i>	<i>Municipal Allocation in AFY (million gpy)</i>	<i>Industrial Allocation in AFY (million gpy)</i>	<i>Total Allocation in AFY (million gpy)</i>
Well 62-1	68 (22.2)	18.32 (6.0)	86.35 (28.1)
Well 106-2	35.5 (11.6)	50.75 (16.5)	86.25 (28.1)
ISAFAF Well 3	-	20.00 (6.5)	20.00 (6.5)
Total	103.5 (33.7)	89.07 (29.0)	192.57 (62.7)
<i>Source:</i> Compiled from <i>Water Requirements Study of the Nellis Air Force Range</i> (USAF 1998). 1 AF = 3.259x10 <sup>5</sup> gallons.			

Current demand on the ISAFAF water supply system is estimated at an annual average of 88,000 gallons per day (gpd) (approximately 32 million gpy or 98.6 AFY). The ISAFAF General Plan identifies the current water supply at ISAFAF as adequate yet stressed (USAF 2003).

Water supply on Nellis AFB and surrounding communities is supplied by Southern Nevada Water Authority (SNWA) and is complemented by nine potable water wells on or near the base (USAF 2003). Approximately 80 percent of the base water supply is provided by SNWA. Current supply at Nellis AFB is considered adequate (USAF 2003).

### Groundwater Quality

Groundwater in the region is high in total dissolved solids (TDS) at levels of 500-1,000 mg/l and rich in calcium and magnesium bicarbonate; however, the groundwater is well within the EPA standards for drinking water quality (USAF 2002a).

## 3.7 BIOLOGICAL RESOURCES

The ROI for biological resources includes (1) the immediate vicinity of ISAFAF, where ground disturbance would occur and low-level aircraft activity would increase; and (2) the area of proposed new storage bunkers within the existing munitions storage area (MSA) at Nellis AFB.

### 3.7.1 Definition of the Resource

Biological resources include plants and animals and the habitats in which they occur. Habitats are defined on the basis of a combination of physical (location, elevation, climate, geology, hydrology) and biological (plant and animal species) features that occurs with some consistency or pattern within the region of interest. Vegetation, consisting of one or more distinct plant communities or associations with one-to-few dominant species, is particularly important as it often indicates the potential suitability of the habitat for particular plant or wildlife species, including those with special status (e.g., species listed under the Endangered Species Act). For the purposes of this analysis, biological resources are presented in two categories: 1) Vegetation and Wildlife and 2) Special Status Species.

### 3.7.2 Vegetation and Wildlife

#### Vegetation

The ISAFAF lies within the northeastern portion of the Mojave Desert at an elevation of approximately 3,120 feet. The surrounding landscape is typical of the Mojave Desert, with low-lying enclosed basins surrounded by low mountains and bajadas formed of coalescing alluvial fans. On the bajadas and mountain slopes, the vegetation is typically dominated by creosote bush (*Larrea tridentata*), with which white bur-sage (*Ambrosia dumosa*) is commonly co-dominant. Additional associates include saltbushes (*Atriplex* spp.), Mormon tea (*Ephedra* spp.), brittlebush (*Encelia virginensis*), desert mallow (*Sphaeralcea ambigua*), cholla and prickly pear cacti (*Opuntia* spp.), and Mojave yucca (*Yucca schidigera*). At higher elevations (~4,000 feet), Joshua tree (*Yucca brevifolia*) becomes prevalent. On valley bottoms and dry lake beds (playas) at lower elevations, where soils are relatively fine, alkaline and clayey, saltbushes, including four-wing saltbush (*Atriplex canescens*), shadscale (*A. confertifolia*), and allscale (also called cattle spinach) (*A. polycarpa*) dominate the vegetation. Matchweed (*Gutierrezia sarothrae*), buckwheat (*Eriogonum* spp.), and cheesebush (*Hymenoclea salsola*) also occur in saltbush scrub in the study area (Dames & Moore 1996a). Between these two primary vegetation types or ecosystems, local communities and associations dominated by different combinations of the above species and associated wildlife may be differentiated (Clark County 2000; USFA 1998; Dames & Moore 1996a). Around springs and drainage bottoms are found honey mesquite (*Prosopis glandulosa* var. *torreyana*), catclaw (*Acacia gregii*), cattle spinach, and introduced salt cedar (*Tamarix* spp.). Fan palms (*Washingtonia* spp.) and a variety of non-native species are commonly planted in

developed areas. Highly disturbed sites tend to be dominated by introduced species such as Russian thistle (*Salsola kali*).

Vegetation surrounding the ISAFAF was systematically evaluated and mapped by Dames and Moore (1996a) and is shown in Figure 3.7-1. Mixed scrub vegetation typical of the Mojave Desert occurs on lands surrounding ISAFAF, where several associations including creosote bush, bur-sage, and different species of saltbush can be distinguished (Dames & Moore 1996a).

Within the fenced area of the airfield, the vegetation is very sparse due to disturbance and is dominated by non-native Russian thistle. Surrounding vegetation and wildlife habitat outside of the fence consists of creosote bush scrub and saltbush scrub (Figure 3.7-1; Dames & Moore 1996a). Two different associations of creosote bush scrub are recognized: one dominated by creosote bush and white bursage, occurring to the southwest to southeast and to the south surrounding Indian Springs; and another including a mixed scrub association of creosote bush, fourwing saltbush, and shadscale, throughout the area north of ISAFAF. The saltbush scrub occurs on the northeast side of the airfield.

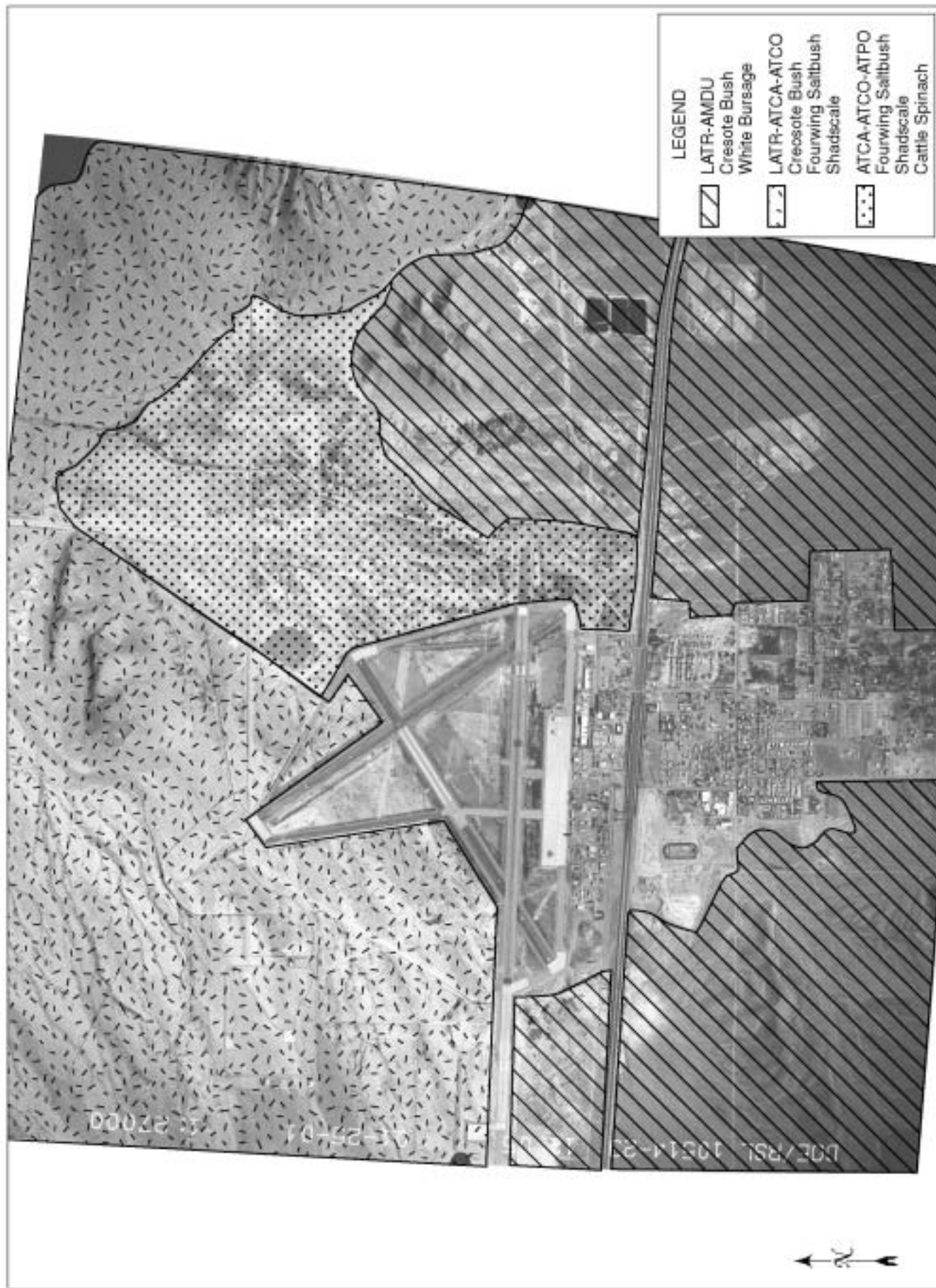
Surface water occurs outside the project area at the municipal sewage ponds to the east along Highway 95, and at several springs in the Indian Springs Valley (USAF 1999). These areas are valuable wildlife habitats (USAF 1999; Dames & Moore 1997a,b); but would not be affected by the project.

The area on Nellis AFB where the new storage bunkers would be constructed is within the fenced MSA and consists of low, rocky hills over which Tertiary volcanic rocks are interspersed with younger alluvium. Vegetation on site is comprised of creosote bush scrub, with widely spaced shrubs interspersed with a number of low growing grasses and forbs. Isolated individual shrubs present include creosote bush, white bur-sage, and saltbush with several associates including Mormon tea and desert mallow. Cacti are rare, and Mojave yucca are virtually absent from the site and surrounding region.

#### **Wildlife**

Wildlife that typically occur in creosote bush scrub and saltbush scrub habitats, and are known or expected to occur in the project areas on ISAFAF and Nellis AFB, primarily outside of the fences, are as follows (Dames & Moore 1996a; USAF 1997, 1999):

1. A diverse herpetofauna that includes desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callosaurus draconoides*), side-blotched lizard (*Uta stansburiana*), horned lizards (*Phrynosoma* spp.), western whiptail (*Cnemidophorus tigris*), and the desert tortoise (*Gopherus agassizii*). Several snakes may also be present, including kingsnake (*Lampropeltus getulus*), rosy boa (*Lichanura trivirgata*), gopher snake (*Pituophis melanoleucus*), and Mojave rattlesnake (*Crotalus scutulatus*).
2. Birds that include a variety of ground-dwelling seed or insect eaters such as jays, wrens, shrikes, towhees, sparrows, Gambel's quail (*Callipepla gambelii*), sage thrasher (*Oreoscoptes montanus*) and mourning dove (*Zenaida macroura*); the omnivorous raven (*Corvus corax*); greater roadrunner (*Geococcyx californianus*), which feeds on snakes and lizards; and several species of raptors, including golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and northern harrier



(*Circus cyaneus*). Burrowing owls (*Athene cunicularia hyugae*) occur at the northern end of the runways at ISAFAF (Dames & Moore 1996a).

3. Mammals that include black-tailed jackrabbits (*Lepus californicus*), desert woodrat (*Neotoma lepida*), kangaroo rats (*Dipodomys* spp.), coyote (*Canis latrans*), and desert kit fox (*Vulpes macrotis arsipus*). Several species of bats may occur in the general area, attracted by water and associated insects at the municipal sewage ponds and the springs in Indian Springs Valley (Dames & Moore 1997a). Pipistrelle (*Pipistrellus hesperus*) and California myotis (*Myotis californicus*) were documented in surveys at Indian Springs (Dames & Moore 1997a).

#### 3.7.3 Special Status Species

Special status species include federally listed threatened and endangered species, candidates for such listing, and “species of concern” as identified by the U.S. Fish and Wildlife Service (USFWS). Species of concern may also include Nevada state-listed species. The USFWS (Appendix A) has provided information on special status species that potentially occur in the project vicinity at ISAFAF; these species may also occur in the vicinity of Nellis AFB. These special status plant and wildlife species, including information on occurrence and habitat affinities, are listed in Tables 3.7-1 and 3.7-2, respectively. A formal Section 7 consultation with USFWS is in progress for all of NTTR, including ISAFAF.



**ISAFAF is adjacent to the Desert National Wildlife Range.  
Within and adjacent to the fenced area, the vegetation  
is very sparse due to past disturbance.**

**Table 3.7-1. Special Status Plant Species Potentially Occurring in the ROI<sup>1</sup>**

Scientific Name Common Name	Regulatory Status <sup>2</sup>	Heritage Rank <sup>3</sup>	Description, Flowering Period	Distribution and Habitat (reference)
<i>Arctomecon californica</i> Las Vegas bearpoppy	SOC, CE	G3S3	Cespiteous perennial herb, with 6-20 yellow flowers on each stalk; flowers April-May	Clark County; reported on NAFB. On barren slopes, flats, and hummocks, often on gypsum soils, in creosote bush scrub, 1,310-2,760 feet (Mozingo and Williams 1980).
<i>Arctomecon merriamii</i> Merriam's bearpoppy	SOC, BLM	G3S2	Clumped perennial herb, with white flowers borne singly on stalks; flowers April-June	Clark, Lincoln, and Nye counties, on NTTR with 40 populations on South Range, including locations along the east side of ISAFAF. Shallow gravelly soils, limestone outcrops, flats and dry lakebeds, in various Mojave Desert scrub communities, 2,000-6,300 feet (Mozingo and Williams 1980; Dames & Moore 1996a; TNC 1997).
<i>Astragalus nyensis</i> Nye milkvetch	SOC	G3S3	Slender, diffuse annual herb; flowers April-May	Clark, Lincoln, and Nye counties, on outwash fans and gravelly flats, sometimes in sandy soil, in creosote bush scrub vegetation, 1,100-5,600 feet. (Mozingo and Williams 1980; Nevada Natural Heritage Program 2001).
<i>Eriogonum heermannii</i> var. <i>clokeyi</i> Clokey buckwheat	SOC, BLM, USFS	G5T2S2	Low, shrubby perennial, with erect stems arising from prostrate branches; flowers late spring- summer	Clark and Nye counties, carbonate outcrops, talus, scree, and gravelly washes and banks, in creosote bush scrub, shadscale, and blackbrush vegetation 4,000-6000 feet (Nevada Natural Heritage Program 2001).
<i>Perityle intricata</i> Delicate rockdaisy	SOC, BLM	G3Q3S3	Subshrub; flowers late spring-early fall	Clark, Lincoln, and Nye counties, in crevices and rubble of carbonate outcrops in the shadscale, blackbrush, and mixed shrub zones, 2,620-6,000 feet; occurrences north and west of ISAFAF. (Nevada Natural Heritage Program 2001).
<i>Phacelia filae</i> Clark phacelia	SOC	?	Diminutive annual herb; flowers April-May	Clark, Lincoln, and Nye counties, newly discovered species resembling <i>Phacelia beatleyae</i> presumed to have similar habitat affinities, potentially occurring on gravel or volcanic tuff, along washes and in canyons, also on slopes. In barren areas, creosote bush scrub, shadscale scrub, 2,500-5,800 feet (Atwood et al. 2002).
<p>Notes:</p> <ol style="list-style-type: none"> <li>Based on correspondence from U.S. Fish and Wildlife Service, March 17, 2003. Includes species that are known from the general vicinity of ISAFAF.</li> <li>Status abbreviated as follows: Federal Status FC = Candidate for federal listing as threatened or endangered SOC = Federal Species of Concern, indicating former candidate status and potential for reconsideration in the future. BLM = listed on Nevada BLM Sensitive Species List (4/97).</li> <li>TNC Rankings (TNC 1997) abbreviated as follows: G = Global rank indicator, based on worldwide distribution at the species level T = Trinomial rank indicator, based on worldwide distribution at the infraspecific level S = State rank indicator, based on distribution within Nevada at the lowest taxonomic level Q = Taxonomic status questionable or uncertain 1 = Critically imperiled due to extreme rarity, imminent threats, or biological factors 2 = Imperiled due to rarity or other demonstrable factors 3 = Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction 4 = Apparently secure, though frequently quite rare in parts of its range, especially at the periphery 5 = Demonstrably secure, though frequently quite rare in parts of its range, especially at the periphery</li> </ol>				

**Table 3.7-2. Special Status Wildlife Species Potentially Occurring in the ISAFAF Vicinity**  
(page 1 of 2)

Page 10 of 17

Species	STATUS		Habitat, Potential Occurrence on ISAFAP (Reference)
	Federal	State	
LISTED SPECIES			
Desert tortoise ( <i>Gopherus agassizii</i> )	T	T	Present in low densities throughout Mojave Desert scrub. Occurs on land around ISAFAP, unlikely but possible in disturbed airfield area (Dames & Moore 1996a). Known to occur at the MSA (personal communication, J. Campe).
SPECIES OF CONCERN			
Mammals			
Townsend's big-eared bat ( <i>Plecotus townsendii</i> )	SOC, BLM		Roosts in caves, mines and buildings, widely distributed. Possible in vicinity of ISAFAP and elsewhere on NTTR (Dames & Moore 1997a).
Spotted bat ( <i>Euderma maculatum</i> )	SOC	T	Found in various habitats from desert to mountain coniferous forest but always in association with nearby high cliff faces. Unlikely to occur on ISAFAP due to lack habitat and water (Dames & Moore 1997a).
Greater western mastiff bat ( <i>Eumops perotis californicus</i> )	SOC		Inhabits rugged canyons with caves, rock crevices, also in buildings. In Nevada, not known to occur north of Las Vegas, therefore unlikely on ISAFAP (Dames & Moore 1997a).
Allen's big-eared bat ( <i>Idionycteris phyllotis</i> )	SOC, BLM		Typically associated with sagebrush, pine and oak forests. Roosts in caves. No habitat on ISAFAP (Dames & Moore 1997a).
California leaf-nosed bat ( <i>Macrotus californicus</i> )	SOC, BLM		Found in arid lowlands, desert scrub vegetation of the Sonoran and Southern Mojave Deserts. Colonial, roosts in caves and abandoned buildings. Unlikely to occur at ISAFAP, which is north of known range limit (Dames & Moore 1997a).
Small-footed myotis ( <i>Myotis ciliolabrum</i> )	SOC, BLM		Occurs in a variety of habitats, but most common in arid environments at middle to upper elevations; roosts primarily in caves, buildings, mines, or crevices. Unlikely on ISAFAP due to low elevation, lack of water (Dames & Moore 1997a).
Long-eared myotis ( <i>Myotis evotis</i> )	SOC, BLM		Occurs primarily in forests, but also less frequently in sagebrush and chaparral habitats. Roosts in cracks in cliffs, hollow trees, caves, mines, and buildings. Not likely on ISAFAP due to low elevation, lack of water (Dames & Moore 1997a).
Fringed myotis ( <i>Myotis thysanodes</i> )	SOC, BLM		Found in sagebrush, shrub-steppe, oak- pinyon, and coniferous forest habitats. Roosts in caves, rock crevices, and buildings. Not likely on ISAFAP due to low elevation, lack of water (Dames & Moore 1997a).
Cave myotis ( <i>Myotis velifer brevis</i> )	SOC, BLM		Reaches northern limit in southern Clark County; maternity and nursery colonies in mines, caves, under bridges, migrates south during winter. Occurs in desert scrub, but always near water. Not known or expected on ISAFAP (Dames & Moore 1997a).

**Table 3.7-2. Special Status Wildlife Species Potentially Occurring in the ISAFAP Vicinity**  
(page 2 of 2)

<i>Species</i>	STATUS		<i>Habitat, Potential Occurrence on ISAFAP (Reference)</i>
	<i>Federal</i>	<i>State</i>	
Long-legged myotis ( <i>Myotis volans</i> )	SOC, BLM		Typically associated with montane forests but also found in riparian and desert habitats. Roosts in rock crevices in cliffs, cracks in ground, behind loose bark on trees and in buildings. Unlikely at ISAFAP due to low elevation, lack of habitat (Dames & Moore 1997a).
Yuma myotis ( <i>Myotis yumanensis</i> )	SOC, BLM		Found in areas with trees adjacent to open water. Roosts in caves, tunnels and buildings. Known from Spring Mountains, but unlikely at ISAFAP due to lack of habitat (Dames & Moore 1997a).
Big free-tailed bat ( <i>Nyctinomops macrotis</i> )	SOC		Occurs in rugged mountainous country, associated with large bodies of water; may roost in buildings. Unlikely in vicinity of ISAFAP which is near the western limit of known range and does not provide suitable habitat (Dames & Moore 1997a).
<b>Birds</b>			
Western burrowing owl ( <i>Athene cunicularia</i> )	SOC	P	A spring and fall migrant and breeder on the NTTR. Recorded on NTTR in Great Basin desert scrub and expected in slightly disturbed areas. Found just north of the runway at ISAFAP (Dames & Moore 1996a).
Gray flycatcher ( <i>Empidonax wrightii</i> )	SOC		Widespread breeding resident of Great Basin, typically in middle to upper elevation montane habitats, not known or expected on ISAFAP (Dames & Moore 1997b).
Phainopepla ( <i>Phainopepla nitens</i> )	SOC	P	Permanent resident of Mojave Desert scrub and desert spring habitats. Feeds on mistletoe berries, typically in mesquite thickets. Observed in vicinity of ISAFAP but not likely to occur in areas of project activity due to lack of habitat (Dames & Moore 1996a).
Lucy's warbler ( <i>Vermivora luciae</i> )	SOC		Found in Mojave Desert riparian habitats. Possible in vicinity of ISAFAP but unlikely in project area due to lack of habitat (Dames & Moore 1997b).
<b>Reptiles</b>			
Banded Gila monster ( <i>Heloderma suspectum cinctum</i> )		T	Mojave desert scrub habitats in extreme southernmost Nevada (Stebbins 1985). Unlikely in immediate project area due to marginal conditions for the species (near northern limit of range), disturbance, lack of habitat.
Chuckwalla ( <i>Sauromalus obesus</i> )	SOC, BLM		Expected in rocky hillsides and rock outcrops in Mojave Desert scrub habitats in southern Nevada (Stebbins 1985). Unlikely in immediate project area due to disturbance and lack of habitat.
<p><i>Notes:</i> E Endangered T Threatened SOC Federal Species of Concern BLM Nevada BLM Sensitive Species List CE Listed as Critically Endangered by Nevada Department of Wildlife P Protected by the Nevada Division of Wildlife</p> <p><i>Sources:</i> Air Force 1981, 1994a, 1997g, 1997, 1997e; Burt and Grossenheider 1980; Hall 1946, 1981.</p>			

#### ***Indian Springs Air Force Auxiliary Field***

The disturbance footprint of the proposed project at ISAFAF is confined to disturbed, mostly barren areas. As a result, with the exception of the desert tortoise and burrowing owl, no special status plant or animal species are known or likely to occur in the areas subject to ground disturbance at ISAFAF. Desert tortoises are known to occur on land surrounding ISAFAF, but were not detected in a survey of the airfield area (Dames & Moore 1996a), and their occurrence is unlikely given the level of disturbance and activity.

Burrowing owls have been known to occur in burrows in the disturbed soil at the north end of the runway at ISAFAF (Dames & Moore 1996a). Burrowing owls and other migratory birds are protected from unauthorized harm by the Migratory Bird Treaty Act and Executive Order 13186. For the sake of this analysis, burrowing owls are considered potentially present as either nesting or wintering individuals in the area subject to ground disturbance.

#### ***Nellis AFB Munitions Storage Area***

At the Nellis MSA, no sign of desert tortoises or their burrows was noted on site, and insufficient quantity and quality of forage species as well as a lack of suitable substrate for burrowing due to the shallow depth and rocky nature of soils in the area were noted. Tortoises are known to occur, however, in the vicinity of the MSA (personal communication, J. Campe).

The state-listed Las Vegas bearpoppy occurs on Nellis AFB in the vicinity of the MSA (personal communication, J. Campe). However, this species was not found in the area of the proposed storage bunkers during a site inspection in April 2003. The site does not appear suitable for the species as it lacks the gypsum soils associated with this species.

### **3.8 CULTURAL RESOURCES**

The ROI for cultural resources includes the sites and immediate vicinities where construction or ground disturbance would occur as a result of project-related actions. This includes numerous areas on ISAFAF and the area of the proposed new munitions storage structures at Nellis AFB.

#### **3.8.1 Definition of the Resource**

Cultural resources are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. They include archeological resources (both prehistoric and historic), historic architectural resources, and traditional resources. Only significant cultural resources (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action. Significant archeological and architectural resources are either eligible for listing, or listed on, the National Register of Historic Places (National Register). Significant traditional resources are identified by Native American tribes or other groups, and may also be eligible for the National Register. Traditional resources may include archeological sites, locations of historic events, sacred areas, sources of raw materials, topographic features, traditional hunting or gathering areas, and native plants or animals.

DoD's *American Indian and Alaska Native Policy* (1999) emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The Policy requires an assessment, through consultation, of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services.

### 3.8.2 Existing Conditions

#### *Historic Setting*

*Prehistoric Background.* The chronological history of the prehistoric human occupation in the region is typically divided into four periods: Lake Mojave Period (ca. 12,000 - 7,000 years ago), Pinto Period (ca. 7,000 – 4,000 years ago), Gypsum Period (ca. 4,000 – 1,500 years ago), and Saratoga Springs Period (ca. 1,500 years ago – European contact [about 450 years ago in this region]). The best evidence of initial human occupation dates to about 12,000 years ago, when the first inhabitants focused on hunting large Pleistocene mammals. Lake Mojave Period sites are typically found along the shorelines of ancient lakes although the exact role of the lakes in the overall adaptation of prehistoric peoples is still somewhat unclear. During the Pinto Period, the climate became both warmer and drier, and human behavior changed in step with the changing natural environment. Archeological sites contain increasing numbers of millingstones for plant exploitation, especially hard seeds, although hunting still played an important role. By about 5,000 years ago, the temperature began to decline and effective precipitation increased. Technological changes, including the use of mortars and pestles (possibly for mesquite exploitation), suggest that people reacted to the changing environment by making use of new foods. The technological innovations typical of the Gypsum Period appear to have supported larger population sizes and increased socioeconomic ties between groups. The Saratoga Springs Period marks a time of regional differentiation throughout the Mojave Desert and the introduction of the bow and arrow. There was also an apparent expansion of Numic-speaking groups throughout most of the Great Basin around 1,000 years ago.

*Ethnographic Background.* At the time of first European contact, the Indian Springs area was occupied by the Southern Paiute, a Numic-speaking group who probably arrived in the area about 1,000 years ago. The Las Vegas subgroup of the Southern Paiute inhabited a relatively large area extending into the Mojave Desert, and commonly employed a relatively mobile settlement system dependent on the seasonal availability of a wide variety of plants and animals. Early European contact with the Southern Paiute had very little direct impact until about the early nineteenth century, when Spanish impacts were both direct and devastating. Spanish colonies of northern New Mexico institutionalized slavery, and it appears that Southern Paiutes may have been held as slaves in Santa Fe and surrounding communities as early as the late 1700's (Dames & Moore 1996b). Slave trading ended after the Mormons arrived in Utah in 1847, but Mormon farms and settlements soon displaced Southern Paiutes from their best lands. Several reservations were later established, including the Moapa Reservation on the Muddy River in 1872, the Colorado River Reservation in 1874, the Shivwits Reservation in 1891, and the Las Vegas Colony in 1911 (Dames & Moore 1996b).

*Historic Background.* Indian Springs was originally known as "Indian Creek," where Charles Towner operated a ranch and rest stop since the 1870s. The arrival of the Las Vegas & Tonopah Railroad in 1906, which ended at Indian Springs, spurred interest in the area. The closure of the

tracks in 1918 had a direct affect on the community, with property changing hands between the homesteaders and larger entities like the Naquinta Cattle Company and the Nevada Hotel Mining Company (Dames & Moore 1996b). The next significant event in Indian Springs was the development of the Indian Springs Air Field in 1943, and its association with what would become Nellis AFB (originally the Army Air Corps Gunnery School and then the Las Vegas Air Force Base). The Indian Springs Air Field was closed in 1945, but was re-activated as the Indian Springs Air Force Base in 1950 and later renamed the ISAFAF (Dames & Moore 1996b; Page & Turnbull 1988). It has supported several range/test site missions including nuclear testing programs, combat training exercises, weapon system evaluations, and training for the Air Force Thunderbirds (USAF 2003). Predator assets were added to ISAFAF in 1995, when the Air Force activated the first Predator squadrons at ISAFAF (USAF 2003).

#### *Identified Cultural Resources*

##### *ISAFAF*

*Archeological Resources.* An intensive archeological survey of ISAFAF was conducted in 1995 in compliance with Section 110 of the National Historic Preservation Act (NHPA) (Dames & Moore 1996b). Thirteen archeological sites were recorded during the survey, including ten prehistoric sites and three historic sites. All of the sites, except two prehistoric sites (26CK3906 and 26CK5266), were determined not eligible for inclusion in the National Register. The remaining two sites were recommended as eligible for inclusion in the National Register based on their potential to yield information important to knowledge of the region's prehistory (Dames & Moore 1996b). The Nevada State Historic Preservation Office (SHPO) concurred with these site eligibility determinations in a letter dated 21 March 1996. The significance of 26CK3906 and 26CK5266 was later re-evaluated (Myhrer 1996), and the sites were determined not eligible for inclusion in the National Register. SHPO concurred with this revised significance determination in a letter dated 5 July 1996.

*Historic Structures.* An inventory and evaluation of World War II structures at ISAFAF was conducted in 1988 (Page & Turnbull 1988). The inventory recorded ten World War II era structures still standing at ISAFAF and determined that none of these properties appear to be eligible for the National Register either individually or as part of a district (Page & Turnbull 1988). SHPO concurred with this determination in a letter dated 14 June 1991. An inventory of Cold War era structures at ISAFAF was conducted in 1994 (Mariah and Associates 1994); no Cold War era significant structures were identified at ISAFAF.

*Traditional Resources.* Seventeen tribes have been identified, through ethnographic and historic research, to possess ancestral ties with the NTTR. The Indian descendants are within the Southern Paiute, Owens Valley Paiute, and Western Shoshone cultural traditions. The tribes are located in a 250-mile radius of Nellis AFB in Arizona, California, Nevada, and Utah. Beginning in 1996, Nellis AFB and Indians with ancestral ties to NTTR created a Native American Interaction Program (NAIP) with year-round active field and meeting participation by 16 tribal chairs and 32 designated representatives. NAIP offers Native American participation in field trips to ancestral sites, archeological research, and ethnographic studies. An NAIP Document Review Committee was formed in 1999 to review Nellis AFB environmental reports and to provide comments.

While all parts of the land and resources are valuable to Native American people, they have assisted Nellis AFB in designating the most sensitive areas in which to invest scarce protection funds and additional research. In a 15-mile radius surrounding ISAFAF, the Spotted Range and Pintwater Cave possess significant ceremonial sites based on Native American field research and document reviews; these sites are monitored for protection.

Although no Native Americans participated in the archeological survey of ISAFAF (which occurred before the implementation of NAIP), Native Americans have been involved with several compliance archeological inventories within 5 miles of ISAFAF. In addition, a large percentage of ISAFAF was disturbed at the time of the survey. In similar instances, when previously disturbed land was evaluated for cultural resource sensitivity, participants in NAIP agreed with the Nellis AFB archeologists that this type of impacted land has low potential for locating archeological sites with integrity. Thus, while the program was not created until after the ISAFAF inventory, the similarity of environment and previous land disturbance suggests that NAIP participants would likely have concurred with the final determination of no historic properties at ISAFAF.

#### *Nellis AFB*

Efforts to identify and evaluate cultural resource properties within Area II of Nellis AFB, which houses the base Munitions Storage Area and is the proposed location of the new munitions storage structures, are described in cultural resources reports *Archaeology of Areas II and III, Nellis AFB* (Environmental Solutions, Inc 1995), *A Class III Inventory in Areas II and III* (Rowe 2000), and *Reevaluation of Archaeological Sites on Nellis AFB* (Rowe and Myhrer 2001). SHPO consultation was completed with letters dated 15 March 1995, 3 January 2001, and 12 April 2001. Site 26Ck4984, a prehistoric quarry site, located on the south side of the perimeter fence in Area II and outside the proposed project area, is the only eligible property in Area II.



**Surveys for archaeological, historic, and traditional resources were conducted on ISAFAF during the 1990s. No sites have been identified as eligible for listing in the National Register.**

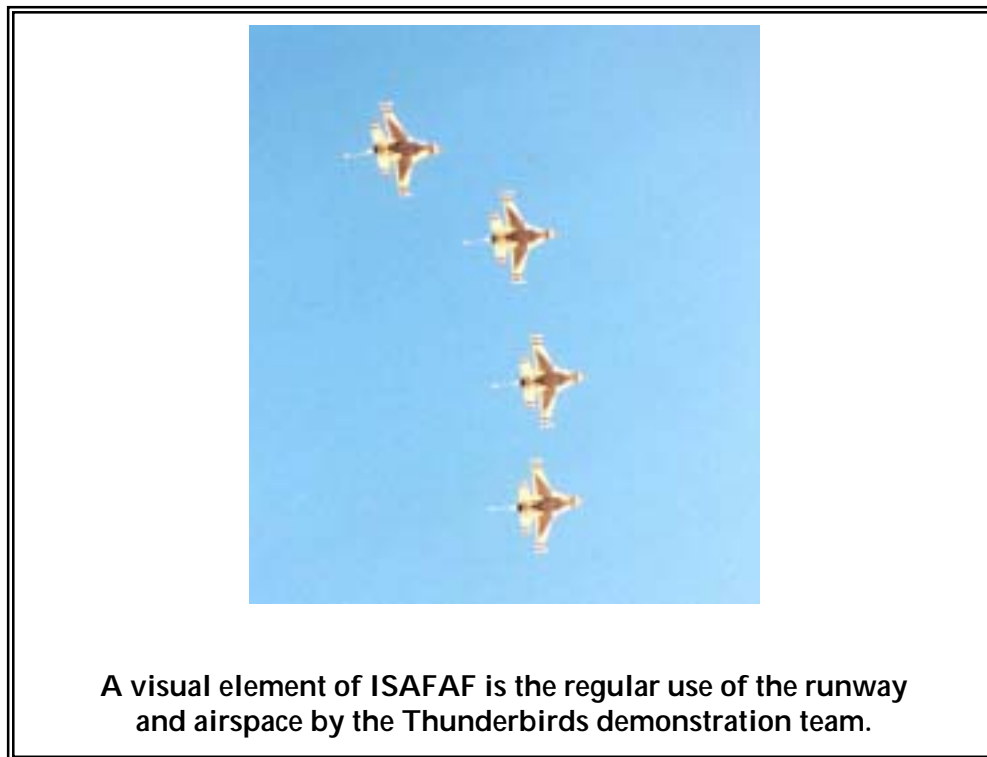
### 3.9 VISUAL RESOURCES

The ROI for visual resources includes ISAFAF and the neighboring town of Indian Springs and the surrounding countryside.

#### 3.9.1 Definition of the Resource

The viewscape is defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impression that an observer receives of an area or its landscape character. Topography, landforms, water surfaces, vegetation, man-made features, and the degree of panoramic view available are considered characteristics of an area if they are inherent to the structure and function of the landscape.

Landscape character is studied to determine whether changes in visual character could occur and whether such potential changes are compatible with an affected setting or would noticeably contrast with it. The significance of a change in visual character is influenced by social considerations, including public value placed on the resource, public awareness of the area, and general community concern for the viewscape associated with an area.



#### 3.9.2 Existing Conditions

The surrounding landscape is typical of the Mojave Desert, with low-lying enclosed basins surrounded by low mountains, and bajadas formed of coalescing alluvial fans. ISAFAF is located in the southern part of the Great Basin, which is characterized by steep, north-trending mountain ranges that are separated by vast alluvial basins. Elevations in the vicinity range from approximately 3,000 feet in the Indian Springs Valley to over 6,000 feet in the Pintwater

and Spotted Ranges to the north. The topography can be described as high, thin mountain ranges with alluvial basins in between. The ranges are comprised of block-faulted mountains that rise abruptly from flanking bajadas (coalescing alluvial fans). On the bajadas and mountain slopes, the vegetation is typically dominated by creosote bush and white bur-sage.

The air is generally clear allowing grand distant vistas of endless desert, imposing mountain ranges, and blue skies. The viewscape is what attracts many people to the desert, and the views in the desert surrounding ISAFAF do not disappoint. Within the base and the town, however, the views of the immediate vicinity are different. Manmade alterations and intrusions abound and generally replace the naturalness and wildness of the undisturbed desert.

ISAFAF is adjacent to U.S. 95, and essentially the entire base is visible to the traveling public. Buildings, fences, parked vehicles, water towers and all manner of built environment is unavoidably visible. To the highway traveler, however, the brief visual intrusion of the relatively small base and the even smaller town is a minor diversion that passes in a minute or so before the viewer returns to relatively undisturbed desert vistas.

### **3.10 LAND USE**

The ROI for land use includes the area within and adjacent to ISAFAF and the Nellis AFB MSA.

#### **3.10.1 Definition of the Resource**

The attributes of land use addressed in this analysis focus on general land use patterns, management plans, policies, and regulations. These provisions determine the types of uses that are allowable and identify appropriate design and development standards to address specially designated or environmentally sensitive areas.

#### **3.10.2 Existing Conditions**

##### ***Indian Springs Air Force Auxiliary Field***

ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada on Highway 95, within the overall boundaries of the Nevada Test and Training Range (NTTR), as depicted on Figure 1-1. Land uses within NTTR are designated for military activities. ISAFAF is within the South Range of NTTR. South Range lands were withdrawn for exclusive military use pursuant to the enactment of the Military Land Withdrawal Act (MLWA) of 1999, PL 106-65.

Most of the federal lands outside of NTTR are under the jurisdiction of BLM. BLM's guiding principle of multiple use extends to the use of federal lands withdrawn for national defense and security, which although not available for public use, remain under BLM's management with the exception of Desert National Wildlife Range (DNWR) lands withdrawn to the USFWS. Policies and programs implemented on withdrawn lands must meet federal requirements mandated and administered through BLM.

The DNWR was established for the preservation of desert bighorn sheep in its natural environment. Lands within the DNWR encompass approximately 1,588,00 acres, including lands north of Highway 95. The DNWR is under the sole administration of the USFWS. Joint-

use of the DNWR and NTTR began during World War II when portions of the area near Indian Springs were identified as suitable military training grounds. Use and public access to the joint-use area of DNWR and NTTR is restricted by an MOU between the Air Force and the DOI (for USFWS) and further, by PL 106-65, as amended. The MOU delineates the rights and responsibilities of the two agencies with regard to the overlapping withdrawals.

ISAFAF encompasses approximately 2,830 acres of land. The majority of land at ISAFAF (approximately 81 percent) is designated as open space in order to ensure Clear Zone safety around the airfield. The main ISAFAF airfield, Instrument Runway 08/26, runs east-west across the base. Runway 13/31 runs northwest-southeast across the base and supports RQ-1 Predator UAV operations. A third runway (04/22), which runs southwest-northeast, is inactive.

ISAFAF is the practice base for the Nellis-based Thunderbirds demonstration team and currently supports the beddown of two functional RQ-1 Predator Unmanned Aerial Vehicle (UAV) squadrons. The 11<sup>th</sup> and 15<sup>th</sup> Reconnaissance Squadrons (RS), which are part of the 57<sup>th</sup> Wing (57 WG) and the 99 SFG Ground Combat Training Squadron (99 GCTS) are based at ISAFAF. In addition, the 17 RS is based at ISAFAF, but it has no assigned aircraft.

ISAFAF provides support and maintenance for the NTTR, including 57 WG flying operations, Expeditionary Readiness Training (ExpeRT), and Security Forces Training. ISAFAF is also the primary emergency divert base during NTTR exercises.

Aircraft operations and maintenance facilities are located south of Runway 08/26 in the developed area of the base. Ancillary infrastructure, including a wastewater treatment facility and storage structures are located north of the runway. Several industrial land uses, including supply, vehicle maintenance, and transportation facilities are situated in the main base area, south of the airfield. The base exchange, dining hall, and temporary lodging facilities are also located in the main base area. Table 3.10-1 summarizes the existing land uses at ISAFAF.

**Table 3.10-1. Existing Land Uses at Indian Springs AFAF**

<i>Land Use Category</i>	<i>Present Acreage</i>	<i>Percent of Total</i>
Airfield	227.24	9.55
Aircraft Operations and Maintenance	18.71	0.79
Industrial	193.11	8.12
Administrative	2.63	0.11
Community (Commercial)	0.39	0.02
Community (Service)	3.30	0.14
Medical	0.62	0.03
Temporary Lodging	5.81	0.24
Recreation	8.5	0.36
Open Space	1,918.89	80.65
<b>TOTAL</b>	<b>2,379.20</b>	<b>100</b>
Source: USAF 2003.		

A Functional Relationships Analysis was conducted for ISAFAF. The purpose of this analysis is to determine the spatial relationships that should exist between the various land uses found on base, and to identify incompatible land uses that should be separated. The analysis concluded

that most of the land uses at ISAFAF are appropriately located. For example, the main ISAFAF airfield is located in close proximity to aircraft operations and maintenance facilities and open space. However, some incompatibilities exist concerning the proximity of temporary lodging and medical land uses to the airfield and to adjacent industrial facilities (USAF 2003).

The unincorporated community of Indian Springs is located in northeastern Clark County, Nevada on Highway 95, adjacent to ISAFAF (see Figure 1-1). The community of Indian Springs encompasses approximately 600 acres and is bordered by ISAFAF to the north and by lands managed by the BLM to the east, south, and west. The town has a population of approximately 1,400. Residents express appreciation for rural location and the separation from the large city that Indian Springs provides. The community has a public library, a community center, a fire station, and educational facilities that provide for the needs of the local community.

### ***Nellis AFB Munitions Storage Area***

Approximately 1,784 acres at Nellis AFB (about 13 percent of the base) is designated for industrial uses in three land use areas: Area I, Area II, and Area III. The Nellis Munitions Storage Area (MSA) is located in Area II in the southeast portion of the base. The current storage capacity of the Nellis MSA has been identified as inadequate (USAF 2003).

### **3.10.3 Land Management Plans**

Adopted plans and programs guide land use planning on ISAFAF and Nellis AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development.

The ISAFAF General Plan and the Nellis AFB General Plan provide overall perspectives concerning development and provide frameworks for making effective programming, design, and resource management decisions.

The DoD developed the Air Installation Compatible Use Zone (AICUZ) program in order to achieve compatible land use around military airfields. The purpose of the AICUZ is to balance the needs of aircraft operations and community concerns, while preventing incompatible development. The AICUZ guidelines define zones of high noise and accident potential and recommend uses that are compatible within these zones. The Air Force is currently in the process of drafting an AICUZ plan for ISAFAF. Currently, AICUZ considerations (noise and airfield clearances) do not restrict ISAFAF development (USAF 2003).

## **3.11 SOCIOECONOMICS**

The ROI for socioeconomics is Clark County, Nevada.

### **3.11.1 Definition of the Resource**

For purposes of this EA, socioeconomics includes employment, population, housing, and public schools.

#### 3.11.2 Employment

The largest employers in the vicinity of Indian Springs include ISAFAP, the Southern Desert Correctional Center and Indian Springs Conservation Camp and Boot Camp, and the federal Department of Energy Nevada Test site facility. ISAFAP has 1,157 assigned personnel. The Southern Desert Correctional Center and Indian Springs Conservation Camp and Boot Camp is a combined facility located just east of the community of Indian Springs and ISAFAP. The high security Southern Desert Correctional Center houses 1,354 inmates and has a staff of 246. The minimum security Indian Springs Conservation Camp and Boot Camp house 228 inmates: 168 in the conservation camp and 60 in the boot camp and has a staff of 23. The Department of Energy Nevada Test Site (NTS) located in neighboring Nye County and other NTS-related activities (in Las Vegas) employed about 3,390 persons as of 1999, the large majority (88 percent) of whom were contractor employees. Employment at the NTS increased during the 1970s and 1980s, peaking at 11,500 employees in 1987. With the end of the Cold War and cessation of nuclear weapons testing in 1992, employment declined from 9,300 in 1992 to its current level. Between 1992 and 1998, NTS employment dropped by 3,030 (70 percent) in Nye County and by 1,220 (41 percent) in Las Vegas.

The community of Indian Springs has few employment opportunities within the settlement with the exception of the combined elementary/middle/high school, the county branch library, and highway services. Nearly all residents of the community work elsewhere with an average commute time of 38 minutes. Approximately 12 percent of the working residents of the community are employed outside Clark County, primarily in neighboring Nye County.

Full- and part-time employment in the State of Nevada increased by almost 776,000 jobs (at an average annual rate of 4.9 percent) between 1980 and 2000. Employment levels rose from almost 490,000 in 1980 to just under 767,000 in 1990 and almost 1,265,000 in 2000. The rate of growth in the 1990s was faster (5.1 percent annually) than in the 1980s (4.6 percent annually).

The 10 largest employers in Clark County as of 2001 were: (1) Clark County School District (about 25,500 employees); (2) Bellagio Hotel and Casino (about 8,600 employees); (3) Clark County (about 8,200 employees); (4) MGM Grand Hotel (about 8,100 employees); (5) Bally's and Paris Casino Hotels (about 7,700 employees); (6) Mirage Hotel and Casino (about 6,500 employees); (7) Mandalay Bay Resort and Casino (about 5,600 employees); (8) Caesar's Palace Hotel and Casino (about 5,000 employees); (9) State of Nevada (about 4,800 employees); and (10) Venetian Casino Resorts (about 4,400 employees).

The number of jobs in Clark County increased by just over 593,000 between 1980 and 2000 at an average annual rate of over 6 percent. As with the state, growth was more rapid in the 1990s (with an average annual rate of growth of 6.5 percent) than in the 1980s (with an average annual rate of growth of 5.6 percent). Clark County's share of total statewide employment increased steadily from 54.3 percent in 1980 to 59.9 percent in 1990 to 67.9 percent in 2000. Clark County contributed over three-quarters (76.4 percent) of these new jobs created in the state over the 20-year period.

In 2000, the largest contribution to non-farm employment (44.3 percent) in Clark County was attributable to the services sector of the economy. This contribution has remained virtually constant over the period 1980-2000. Industrial sectors that have increased their share of non-

farm employment over this period include: agricultural services, forestry, and fishing; construction, and finance, insurance, and real estate although their absolute numbers are relatively small. The most noticeable reductions have taken place in the public sectors of the economy: federal civilian; federal military; and state government. The military contribution fell from 4.0 percent in 1980 to 1.1 percent in 2000. As of 2001, the number of active duty personnel assigned to Nellis AFB stood at just over 6,800 with an additional 2,800 civilian employees working on the installation.

### **3.11.3 Population**

Over the period 1990-2001 the population of the State of Nevada increased by over 896,000 persons at an average annual rate of 5.1 percent. A large portion (almost 80 percent) of that growth took place in Clark County where the resident population increased from about 770,000 in 1990 to almost 1,486,000 in 2001. All municipalities within Clark County (with the exception of Boulder City) experienced robust growth rates over the period: 10.0 percent average annual rate for Henderson; 5.9 percent for Las Vegas, 17.9 percent for Mesquite; and 8.9 percent for North Las Vegas. Boulder City, which passed a growth control ordinance in 1979 that limited population expansion to 120 new housing units a year, experienced a rate of 1.3 percent annually. Since 1996, population estimates have been developed for unincorporated communities. This information reveals that some of these communities have added sizeable numbers of residents and experienced rapid growth. Over the period 1996-2001, the community of Enterprise grew from about 10,400 to just over 34,000 residents at an average annual rate of 27 percent. The community of Sunrise Manor added 41,500 residents over this period at an average annual rate of 5.7 percent.

Between 1996 and 2001, the population of the community of Indian Springs grew from 1,135 to 1,471, an increase of 336 residents and average growth rate of 5.3 percent annually.

### **3.11.4 Housing**

Housing resources both on-base and off-base are addressed below.

#### ***Off-Base Housing***

Clark County contained almost 560,000 housing units in the year 2000 (U.S. Bureau of the Census). The number of units increased by over 76 percent over the period 1990-2000. The most rapid increase in the number of housing units (over 97 percent) occurred in the municipalities of the county while growth in the unincorporated portions of the county took place at a slower pace (56 percent).

The greatest numbers of units over the period 1990-2000 were added in the municipalities of Las Vegas (81,027 units), Henderson (45,749 units), and North Las Vegas (20,763 units) although sizeable numbers of housing units were added in unincorporated communities such as Spring Valley (30,634 units), Paradise (21,474 units), and Sunrise Manor (21,146 units). Over this time period, the following communities more than doubled their housing stock: Henderson; North Las Vegas; and Spring Valley.

As of 2000, the community of Indian Springs contained 638 housing units of which the large proportion (81 percent) were comprised of mobile homes. Rental units comprised 43.3 percent of occupied housing units. Almost 75 percent of the householders in the community had resided in their residence for five years or less.

Over the period 1990-1999, an average of over 24,200 housing units were authorized for construction in Clark County. Of this total, about 64 percent were built in the municipalities of the county and 36 percent were constructed in unincorporated sections of the county. The share of total countywide residential construction taking place in the unincorporated portions of the county increased over the period 1990-1999 from a low of 26 percent in 1992 to almost 41 percent in 1998. The contribution to the total growth made by Henderson increased from a low of 15 percent in 1994 to almost 22 percent in 1999. The contribution by North Las Vegas to the growth in housing increased from almost 4 percent in 1990 to almost 10 percent in 1999. Las Vegas saw its contribution fall from over 44 percent in 1990 to about 27 percent in 1999.

Of the residential units that have been authorized for construction over the period 1990-1999 in Clark County (just over 242,000), almost 68 percent were for single unit buildings, less than 1 percent for two-unit buildings, just under 2 percent for three- and four-unit buildings, and almost 30 percent for five- or more unit buildings.

#### *On-Base Housing*

Housing designed and built to accommodate military personnel exists at both Nellis AFB and ISAFAP. Nellis AFB contains housing for personnel both accompanied by dependents (known as Accompanied or military family housing) and without (unaccompanied housing). ISAFAP is the site of temporary housing for unaccompanied personnel only.

#### *Accompanied Housing*

Almost 1,300 housing units on Nellis AFB are designated for accompanied military personnel assigned to the base. The largest number (679 units), contained in Nellis Terrace on the western edge of the main base, is assigned to enlisted personnel. Originally built in the 1950s, demolition and construction programs between 1996 and 2001 resulted in 340 new units. The Manch Manor complex contains 593 units located about 1 mile from the main base. Of these units, 580 (built in the 1960s and 1970s) are assigned to enlisted personnel and 13 units (built in 1983) are assigned to senior officer grade personnel. Dunning Circle, located near Nellis Terrace on the main base, consists of six units assigned to general officer/senior officer grade personnel.

No family housing units are located on ISAFAP.

#### *Unaccompanied Housing*

Nellis AFB has 16 dormitories with a capacity to accommodate 1,210 unaccompanied enlisted personnel. The dormitories are located adjacent to community services and dining facilities.

### *Other Housing*

Other housing assets at Nellis AFB include: six visiting officer quarters (VOQ) containing 368 units; two visiting airman's quarters (VAQ) with 343 units; and nine temporary lodging facilities (TLF) with 60 units.

At ISAFAP, seven buildings accommodate unaccompanied personnel, including: two VOQ buildings that accommodate 28 persons; and five VAQs that accommodate 162 persons.

Approximately 64 percent of active duty personnel and their family members assigned to Nellis AFB reside off the base in surrounding communities.

#### **3.11.5 Public Schools**

Clark County School District provides public school services and facilities through Clark County and had an enrollment of 244,684 students in school year 2001-2002. This level of enrollment represents an increase of 13,559 students (5.9 percent) over the previous year. The district employs a total of 27,158 persons including full- and part-time, substitute, and temporary employees. Of this total, 14,067 (52 percent) were licensed full- and part-time teachers and an additional 2,300 were substitute teachers. The 2001-2002 budget of \$1.19 million showed an increase of almost 9 percent over the preceding year. Funding sources available to the district were: (i) local sales tax (41.3 percent); (ii) property tax (23.0 percent); (iii) state support (27.9 percent); and federal aid and other sources (7.8 percent). Approximate per-pupil expenditures were \$4,921 in school year 2001-2002, up from \$4,774 (a 3.1 percent increase) in 2000-2001.

The public school located in the community of Indian Springs accommodates grades K through 12. Compared to most schools in the district, the Indian Springs Elementary/Middle/High school is small with an enrollment of only 315 students. Its counselor-to-student ratio (1:315), transiency rate (18 percent), student attendance rate (94.1 percent), and computer-to-student ratio (1:3) , however, are all above those for the district as a whole which has values of 1:582, 36 percent, 93.9 percent, and 1:7, respectively. It is, however, one of only a handful of schools to have experienced a decline in enrollment (12 percent reduction) as compared to a district-wide increase in enrollment of almost 5.9 percent.

### **3.12 ENVIRONMENTAL JUSTICE**

The ROI for environmental justice is generally referred to as the region of comparison (ROC). The ROC is the area in which the principal effects arising from implementation of the proposed action are likely to occur. As it applies to ISAFAP, the ROC is Clark County, Nevada. The ROC is used to determine whether significant environmental effects have the potential to adversely impact minority populations and/or low-income populations to a degree that exceeds, or would be likely to exceed, potential impacts on the general public.

#### **3.12.1 Definition of the Resource**

Since the 1970s, public awareness and concern has increased about evidence that low-income and minority communities often suffer disproportionately from exposure to unhealthy

environmental conditions. Excessive exposure to lead, hazardous materials in the workplace, noise and air pollution, and the frequent location of industry and infrastructure developments in these communities are key concerns for the environmental justice movement. In response, President Clinton issued a special Executive Order (12898) in 1994 to raise awareness and bring environmental justice issues into public policy debate.

The EPA (1998) offers the following definition of environmental justice:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The President's Executive Order requires that "to the greatest extent practicable ... each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."

Application of this Executive Order to projects subject to NEPA, such as the proposed project at ISAFAP, suggests that two questions be examined: (1) is a federal project with significant adverse environmental impacts being proposed in a community comprised largely of minority or low-income persons and (2) would any significant adverse human health or environmental effects of the project disproportionately affect minority or low-income persons?

#### 3.12.2 Minority Populations and Low-Income Populations

For purposes of this analysis, minority populations and low-income populations are defined as:

- *Minority Populations* - An individual or group of individuals that are Hispanic, Asian American and Pacific Islander, African-American, American Indian or Alaskan Native.
- *Low-Income Populations* - Persons living below the poverty level, based on \$17, 050 for a family of four as reported in the 2000 census.

The proposed action would increase military facilities and training activities at ISAFAP in order to support the proposed beddown of Predator assets. The population potentially affected by the proposed action is the community of Indian Springs, located directly south of ISAFAP. The community of Indian Springs is located in Clark County, Nevada, and is the focus of this environmental justice analysis.

Data characterizing the current demographic and economic profiles of the project area were obtained from the 2000 Census (U.S. Bureau of the Census 2000). The data show that the community of Indian Springs has a lower percentage of minorities (14 percent) as compared to

the percentage of minorities in Clark County (40 percent) and the state of Nevada (35 percent). The data are presented in Table 3.12-1.

Approximately 10.7 percent of the population of Indian Springs lives below the poverty level (refer to Table 3.12-1). This percentage is proportionate to the percent of individuals living below the poverty line in Clark County (10.8) and in the state of Nevada (10.5).

**Table 3.12-1. Minority and Low-Income Population in 2000**

<i>Category</i>	STATE		CLARK COUNTY		INDIAN SPRINGS CDP	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Total Population	1,998,257	100.0	1,375,765	100.0	1,302	100.0
Total Minority Population	695,256	35.0	547,096	40.0	181	14.0
Hispanic or Latino (all races)	393,970	19.7	302,143	22.0	89	6.8
Not Hispanic or Latino	1,604,287	80.3	1,073,622	78.0	1,213	93.2
One Race	1,555,056	77.8	1,036,940	75.4	1,188	91.2
Black or African American	131,509	6.6	121,401	8.8	15	1.2
American Indian and Alaska Native	21,397	1.1	7,761	0.6	25	1.9
Asian	88,593	4.4	71,226	5.2	15	1.2
Native Hawaiian and Other Pacific Islander	7,769	0.4	5,864	0.4	11	0.8
Some other race	2,787	0.1	2,019	0.1	1	0.1
Two or more races	49,231	2.5	36,682	2.7	25	1.9
Total Individuals Below Poverty Level	205,685	10.5	145,855	10.8	140	10.7
<i>Source:</i> U.S. Bureau of the Census 2000						

### 3.13 INFRASTRUCTURE

The ROI for infrastructure includes ISAFAF and northwest Clark County.

#### 3.13.1 Definition of the Resource

The infrastructure elements addressed in this section include public services (fire protection and police protection) and utility systems (water supply, wastewater collection and treatment, stormwater drainage, electricity, and communications).

#### 3.13.2 Fire Protection

ISAFAF maintains one fire station, located in Building 85, with a staff of 33 firefighters. The base has 30 fire hydrants and approximately 200 feet of fire protection water pipelines. The fire protection system is comprised of alarm detection systems; sprinkler systems, including an aqueous film-forming foam closed head sprinkler system; hood suppression systems; and alarm communication systems. The Fire Department also has aircraft crash apparatus.

The ISAFAF fire suppression system was recently rated as degraded in the 2001 HQ ACC Infrastructure Assessment (USAF 2001c). This evaluation noted deficiencies based on the Life Safety Code for Visiting Officer and Airman quarters and other base facilities, including an aircraft hangar without fire suppression systems.

#### **3.13.3 Police Protection**

Law enforcement services in Clark County are provided by the Las Vegas Metropolitan Police Department. Nevada Highway Patrol is responsible for traffic enforcement and accident investigation on Highway 95. Police protection at ISAFAF is provided by civilian security personnel assigned to the NTTR and stationed at ISAFAF (USAF 1999).

#### **3.13.4 Water Supply**

The ISAFAF water system includes three wells, a liquid chlorine treatment system, a 150,000-gallon water tank, and an old 50,000 non-operational tank. Wells 62-1, 106-2, and ISAFAF Well 3 provide potable water to the base. The system presently treats approximately 88,000 gallons per day (gpd). Daily usage is approximately 95 gpd per person based on information in the ISAFAF General Plan (USAF 2003).

The existing polyvinyl chloride (PVC) piping and 150,000-gallon storage reservoir are considered adequate to meet the current water demands at ISAFAF (USAF 2001c).

#### **3.13.5 Wastewater Collection and Treatment**

ISAFAF owns and operates a wastewater treatment plant. Effluent from flows through a gravity collection system and is treated at an activated sludge treatment plant, before it is discharged into State of Nevada groundwater sources. Treated effluent is held in percolation basins that are used to recharge groundwater supplies. The plant has a design capacity of 90,000 gpd. The plant presently operates at approximately 22 percent of capacity, treating 20,000 gpd, with peak flows of approximately 30,000 gpd (USAF 2003).

ISAFAF maintains a wastewater collection system that collects and transfers wastewater to the influent pumping station. Recent upgrades to the influent pump station include the addition of valves, a valve volt, and a SCADA alarm system (USACE 2003).

ISAFAF has a looped recovery system for industrial wastewater. Currently, industrial wastewater is not discharged into the wastewater collection system.

#### **3.13.6 Stormwater Drainage**

ISAFAF operates and maintains an onsite storm drainage system. Currently, the system is considered inadequate to handle large amounts of water during occasional severe storms (USAF 2001c).

#### **3.13.7 Electricity**

Electrical power is provided to ISAFAF by the Nevada Power Company. The electrical distribution system at ISAFAF consists of a 2,400/4190 volt feeder. Power is provided to the

feeder through a single 13.8/41.6 kilovolt (kV), 5 megavolt-ampere (MVA) transformer to one of three circuit breakers located in a Nevada Power substation (USAF 2003). The existing electrical substation is equipped with a voltage regulator and provides three circuits for base power distribution. A loop feed is utilized for a large part of the Indian Springs circuit. In addition, ISAFAF operates six standby power units and three Equipment Authorization Inventory Data (EAID) systems for emergency operations. ISAFAF does not have a central Energy management System (EMCS), however selected buildings are equipped with control systems (USACE 2003).

Currently, the ISAFAF electrical distribution system is considered degraded, due to the system's age and condition. Overhead electrical circuits located near the flight line violate airfield clearance criteria due to the height and proximity of the lines. The situation is not a safety issue, however, and an Airfield Waiver (LKTC019W) has been obtained for the clearance violation. Additionally, the ISAFAF standby power systems are considered unsatisfactory and are not in compliance with ACC standards (USAF 2001c).

### **3.13.8 Communications**

ISAFAF communication systems consist of standard telecommunication installations. ISAFAF communication systems include telephone systems, satellite connections, radio systems, and communication rooms. The existing CAT-5 cable has a 290-foot limitation (USACE 2003).

## **3.14 TRANSPORTATION**

The ROI for transportation includes the U.S. Highway 95 (U.S. 95) corridor from Las Vegas to the north Clark County line.

### **3.14.1 Definition of the Resource**

Transportation and circulation refer to the movement of vehicles throughout a road and highway network. Primary roads, such as major highways, are principal arterials designed to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads feed arterials that collect traffic from common areas and transfer it to primary roads.

### **3.14.2 Existing Conditions**

Due to its remote location, the roadway network surrounding ISAFAF is minimal. Access consists primarily of U.S. 95, which is the only highway to Las Vegas and to points north (see Figure 1-2). Highway 95 traffic dropped substantially with the reduction in NTS employment between 1992 and 1998 (see section 3.11.2). A few local roads exist to serve the community of Indian Springs, south of the ISAFAF Main Gate. The remaining roadways in the region provide limited access to homes, ranches, and federal lands.

The ISAFAF roadway network includes streets, parking areas, and miscellaneous pavements. The January 2001 Infrastructure Program Review of Roadway Pavement Systems at ISAFAF reports that the overall engineering condition assessment rating of the pavement system is "adequate". A prioritized project list was developed as a result of the above report, and includes projects to repair Perimeter Road and various parking lots on base. (USAF 2003)

The Main Gate has two inbound and two outbound lanes, but is assumed to function as a single lane because of access control. The intersection is signalized and offset to the west from McFarland Ave, the main accesses arterial to Indian Springs. As such, the intersection functions very much like a signalized T and supports right and left turn lanes from U.S. 95. The Main Gate also provides access to the West Frontage Road. Current peak traffic volumes at the Main Gate are 337 vehicles per hour, which is consistent with the current employment of 925 persons.

The East Gate has one inbound and one outbound lane and is assumed to function as a single lane. The East Gate accesses U.S. 95 at a point where the highway is divided, although there is a break in the median at that point. It is configured for single access and egress lanes and is not signalized. Current peak volumes at the East Gate are unknown, but assumed to be less than 100 vehicles per hour due to the limited use of this access point. Historically, the East Gate has been used only for construction traffic and during times of threat when the Main Gate is closed for security reasons.

Most employees arrive at ISAFAP by shuttle, increasing average vehicle occupancy and reducing peak hour traffic volumes well below the levels that would normally be associated with a more typical vehicle occupancy of one person per vehicle.



**Highway 95 is a lightly traveled four-lane divided highway that connects ISAFAP to the Las Vegas area.**

## 3.15 HAZARDOUS MATERIALS AND WASTE

The ROI for hazardous materials use and hazardous waste generation includes the proposed facility sites at ISAFAP and Nellis AFB and their immediate vicinities where construction and operations activities would occur as a result of project-related actions.

### 3.15.1 Definition of the Resource

This discussion of hazardous materials and waste includes the sites and facilities at ISAFAP where hazardous materials are used, stored, or disposed. Potential hazardous waste contamination areas that are under investigation as part of the Air Force Environmental Restoration Program (ERP) are also discussed.

### 3.15.2 Existing Conditions

#### *Hazardous Materials/Waste Management*

Activities at ISAFAF require the use and storage of a variety of hazardous materials associated with general aviation and vehicle maintenance activities. These include, but are not limited to, batteries, anti-freeze, paint, aerosol cans, and solvents (USAF 2003).

The 98<sup>th</sup> Range Wing has a contractor who manages the 90-day Central Accumulation Site (CAS) at ISAFAF. This site accepts all types of hazardous wastes from all ISAFAF users. These units include Air Force personnel, temporary duty units, tenant organizations, associate contractors, and subcontractors who generate hazardous wastes. These organizations operate Initial Accumulation Points (IAP) to accumulate up to 55 gallons of hazardous wastes or 1 quart of acutely hazardous waste prior to transfer to the CAS. Both the IAPs and CASs are subject to regular inspections, which could include operation and facility surveys, waste stream analyses (if required), personnel review for training requirements, and documentation requirements. The Defense Reutilization and Marketing Office (DRMO) contracts for the picking up the hazardous waste and shipment for disposal of the wastes generated on ISAFAF.

#### *Environmental Restoration Program Sites*

For approximately 60 years, ISAFAF has been used as a support area for activities at Nellis Air Force Range (now Nevada Test and Training Range). Activities included in the past, and still include, maintenance of helicopters and vehicles, facility upkeep, fuel/oil storage, as well as storage and maintenance of the Predator UAV. As a result of these activities, several areas on ISAFAF have become contaminated with hazardous or toxic compounds (petroleum products, radioactive material, cleaning and wash materials, paint products, and antifreeze) (USAF 2001b).

Nellis AFB environmental staff has implemented the Air Force ERP to identify and investigate potentially hazardous material disposal sites. The ERP process begins with a Preliminary Assessment (PA) designed to identify and evaluate past disposal and/or spill sites that might pose a potential or actual hazard to public health, welfare, or the environment. The ERP is a vehicle allowing Air Force environmental staff to work with the Nevada Department of Environmental Protection (NDEP) to investigate and remediate environmental impacts in accordance with USAF policy and consistent with the process required by the *Comprehensive Environmental Response, Compensation, and Liability Act National Contingency Plan* (CERCLA NCP), as well as Resource Conservation and Recovery Act (RCRA) and other laws.

The 13 ERP sites present on ISAFAF are listed in Table 3.15-1 (USAF 2001b). Of these sites, 11 are identified as “No Further Action Required” and two have “Long Term Monitoring” Requirements. The locations of the ISAFAF ERP sites are shown on Figure 3.15-1.

ISAFAF is not listed on the Environmental Protection Agency (EPA) National Priority List (NPL), also known as Superfund sites, which is used to determine which sites warrant further investigation and/or abatement or clean-up orders.

**Table 3.15-1. Environmental Restoration Program Sites at ISAF AF**

<i>Site ID (Previous ID)</i>	<i>Description</i>	<i>Materials Disposed</i>	<i>Dates of Operation</i>	<i>Status*</i>
LF-01 (LF-41)	Landfill	General refuse	Early 1950's-1975	LTM
LF-02 (LF-42)	Landfill	Vehicle parts, targets	Unknown	LTM
DP-03	Burial Pits	General refuse	1940's-1950's	NFA
SD-04 (SD-44)	Sewage treatment	Sewage, sludge, effluent	1950's-present	NFA
FT-05 (FT-45)	Fire training area	Fuel	1959-present	NFA
SD-06 (SD-46)	Washdown areas	Radioactive dust	Early 1950's	NFA
SS-07 (SS-47)	Oil spreading site	Oil, POL	Late 1970's	NFA
OT-08 (OT-48)	Munitions burial	Munitions	Unknown	NFA
OT-09 (OT-49)	Munitions burial	Munitions	Unknown	NFA
LF-10 (LF-34)	Landfill	Munitions, general refuse	Late 1950's-1970's	NFA
OT-11	Landfill	Munitions	1950's-1960's	NFA
OT-12 (OT-55)	Munitions burial	Munitions	Unknown	NFA
SD-13 (SD-56)	Drainage ditch	Oil, fire retardant	Unknown	NFA
*LTM: Long Term Monitoring      NFA: No Further Action Recommended <i>Source:</i> Adapted from USAF 2001a				

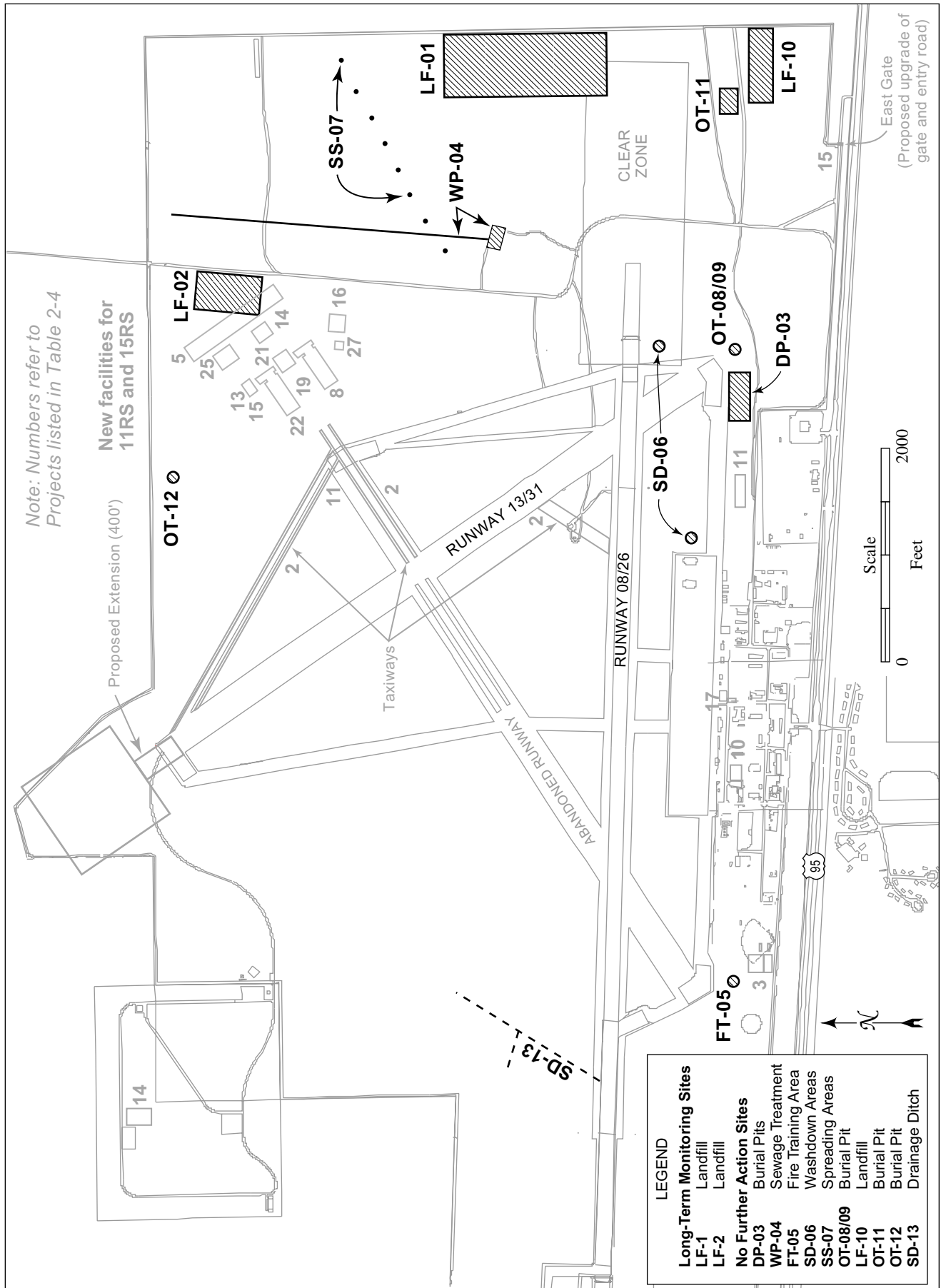


Figure 3.15-1. ERP Sites on Indian Springs AFAF

This page intentionally left blank.

## 4.0 ENVIRONMENTAL CONSEQUENCES

This chapter assesses the potential environmental consequences for all three beddown alternatives and the No Action Alternative.

Environmental impact analysis is a three-step process. The first step defined the proposed action and alternatives in Chapter 2. The proposed action and alternatives provide information for step two, identifying the environmental setting where project actions could result in potential environmental effects. This second step produces the affected environment in Chapter 3.

The third step is presented in this chapter, Chapter 4, where the Predator beddown alternatives from Chapter 2 are combined with the existing environmental setting from Chapter 3 for each potentially affected environmental resource. These environmental resources are interdependent. For example, construction at ISAFAF would require workers whose commuting could affect traffic and air quality. Construction could affect local habitat, which, in turn, could affect wildlife that depends on the habitat. These types of interrelationships explain why the EA is prepared by an interdisciplinary team.

The environmental impact analysis process is designed to focus analysis on those environmental resources that could potentially be affected by the Predator beddown proposed for ISAFAF. Potential effects may result from different aspects of an alternative, such as flying activities, personnel changes, or construction. Where possible, the potential consequences for each resource are quantified in terms of nature, magnitude, and duration.

### 4.1 AIRSPACE MANAGEMENT AND USE

The potential effects of the proposed beddown on the airspace management ROI (the regional air traffic environment) were assessed by considering the changes in aircraft operations and airspace uses that could occur relative to current conditions.

The type, size, shape, and configuration of individual airspace elements in a region are based upon, and are intended to satisfy, competing aviation requirements. Potential impacts could occur if air traffic in the region and/or the ATC systems were encumbered by changed flight activities. When any significant change is planned, such as new or revised defense-related activities within airspace areas, the FAA reassesses the airspace configuration to determine if such changes could adversely affect:

- ATC systems and/or facilities;
- Movement of other air traffic in the area; or
- Airspace already designated and used for other purposes supporting military, commercial, or civil aviation.

The creation of any of these conditions could constitute a significant impact.

#### 4.1.1 Alternative A

Under Alternative A, the same processes and procedures for Predator operations in Restricted Areas, MOAs, Class A, and Class D airspace currently being used would continue. All Air

Force operations involving the Predator would continue to comply with FAA stipulations for such flight. For flights within MOAs, the Air Force would continue to ensure that flight safety equaled that which would exist if a chase aircraft accompanied the Predator. Flight within MOAs would be publicized in regional airports, would not occur if the airspace had been released to the FAA, would only occur under VMC, and clouds would be avoided. Flights transiting through Class A airspace would continue to be flown under IFR, with a pre-approved flight plan filed with ATC. Management and control of airspace utilization is dynamic, and often situationally dependant. However, current procedures have proven effective. Additional communication capabilities will support line-of-sight and beyond line-of-sight Predator operations.

Under Alternative A, annual Predator sorties conducted in the NTTR airspace would increase from 1,080 to 2,988. This represents an increase of 1,908 sorties (approximately 176 percent). This equates to an increase of approximately 7.5 Predator sorties per day over current Predator operations in the NTTR airspace. This NTTR increase equates to an estimated 45 Predator flight hours per day. The most heavily used portion of the NTTR, R-4806, would have an approximate 11.7 percent increase in use.

Although a Predator sortie can be as long as 24 hours, an average of 6 hours per sortie is assumed for this analysis. Predator sorties occur throughout daily flying periods, and Predator activities are scheduled, coordinated, and integrated with other use of the airspace. This is in concert with current airspace management practices employed for the NTTR (personal communication, Callahan 2003).

Annual Predator sorties conducted in the R-2508 Range Complex, located about 80 nm southwest of ISAFAP, would increase from 174 to 960. On average, this would increase operations from approximately 0.7 to 3.8 sorties per day, reflecting an increase of an estimated 15 Predator flying hours daily. These Predator sorties would continue to transit from ISAFAP to the R-2508 Complex using Class A airspace under ATC control over remote areas. Predator sorties would not be in close proximity to other aviation activity. An additional three sorties per day would not be expected to be noted in the ATC system, and would have little or no impact on existing ATC services. Predator sorties using R-2508 would be scheduled with airspace managers at Edwards AFB, and Predator operations would continue to be coordinated and integrated with other aircraft operations occurring in R-2508 airspace.

#### **4.1.2 Alternative B**

Under Alternative B, the same processes and procedures for Predator operations in Restricted Areas, MOAs, Class A, and Class D airspace currently being used and applicable to Alternative A would continue. All Air Force operations involving the Predator would continue to comply with FAA stipulations for such flight. The stipulations include flight safety that equaled that which would exist if a chase aircraft accompanied the Predator, publication of flight with MOAs, VFR only in MOAs, and not entering clouds. Predator sorties would not occur in MOAs if the airspace had been released to the FAA. Flights transiting Class A airspace would be flown under IFR, with a pre-approved flight plan filed with ATC. Current procedures to manage and control the dynamics of airspace have proved effective. Additional communication capabilities will support Predator operations.

Under Alternative B, annual Predator sorties conducted on the NTTR would increase from 1,080 to 3,720. This represents an increase of 2,640 sorties (approximately 244 percent). This equates to an increase of approximately 10.5 Predator sorties, or 63 Predator flying hours per day over current Predator operations. Overall, in considering annual use of applicable elements of R-4806, the increase in Predator operations is an approximate 16 percent increase in use of the airspace. Predator sorties occur throughout daily flying periods, and Predator activities are scheduled, coordinated, and integrated with other use of the airspace. This is in concert with current airspace management practices employed for the NTTR (personal communication, Callahan 2003).

Annual Predator sorties conducted in the R-2508 Range Complex would also increase, from 174 to 960 (the same as under Alternative A). On average, this would increase operations from approximately 0.7 to 3.8 sorties per day, reflecting an increase of an estimated 15 Predator flying hours daily. These Predator sorties would continue to transit from ISAF AF to the R-2508 Complex using Class A airspace under ATC control over remote areas that are not in close proximity to other aviation activity. An additional three sorties per day would not be expected to be noted in the ATC system, and would have little or no impact on existing ATC services. Predator sorties using R-2508 would be scheduled with airspace managers at Edwards AFB, and Predator operations would continue to be coordinated and integrated with other aircraft operations occurring in R-2508 airspace.

#### **4.1.3 Alternative C**

Under Alternative C, the same processes and procedures for Predator operations in Restricted Areas, MOAs, Class A, and Class D airspace currently being used and applicable to Alternative A or Alternative B would continue. All Air Force operations involving the Predator would continue to comply with FAA stipulations described for Alternative A or Alternative B.

Under Alternative C, annual Predator sorties conducted on the NTTR would increase from 1,080 to 1,300. This represents an increase of 220 sorties (approximately 20 percent over the existing airspace use). This equates to an increase of less than one Predator sortie per day over current NTTR Predator operations. This increase in Predator operations would have minimal effect on the scheduling and use of the NTTR.

Annual Predator sorties conducted in the R-2508 Complex would increase from 174 to 210 under Alternative C. On average, this would increase operations from approximately 0.7 to 0.9 sorties per day. This addition in sorties would not be expected to be noted in the ATC system. There would be no discernible impact on the R-2508 airspace.

#### **4.1.4 No-Action Alternative**

Under the No-Action Alternative, the processes and procedures for Predator operations in Restricted Areas, MOAs, Class A, and Class D airspace currently being used would continue unchanged. The number of sorties conducted in the NTTR and R-2508 would continue at current levels. All of the airspace involved in supporting current Predator activities is capable of accommodating those levels of operations.

## 4.2 SAFETY

Numerous federal, civil, and military laws and regulations govern safety operations at ISAFAF. Individually and collectively, they prescribe measures, processes, and procedures required to ensure safe operations and to protect the public, military, and property. These regulations govern all aspects of the daily activity at the installation, and their applicability ranges from standard industrial ground safety requirements (e.g., wearing of hard hats and safety clothing) to complex procedures concerning aircraft flight and maintenance of munitions.

For the proposed action and each alternative, the elements of the proposal that have a potential to affect safety are evaluated relative to the degree to which the action increases or decreases safety risks to aircrews, the public, and property. Ground, fire, and crash safety are assessed for the potential to increase risk, and the unit's capability to manage that risk by responding to emergencies and suppressing fire. In considering explosive safety, projected changed uses and handling requirements are compared to current uses and practices. If a unique situation is anticipated to develop as a result of any of the proposals, the capability to manage that situation is assessed. Analysis of flight risks correlates Class A mishap rates and bird-aircraft strike hazards with projected airspace utilization and flying time associated with the action. When compared to similar data for current use of the airspace, assessments can be made of the magnitude of the safety impacts resulting from the change. Since fire and crash risk are also a function of the risks associated with mishaps and bird-aircraft strikes, those statistical data are also considered in assessing that risk. Finally, when new or altered risks arising from the proposals are considered individually and collectively, assessments can be made about the adequacy of disaster response planning, and any additional or modified requirements that may be necessary as a result of the action.

Impacts could be significant if an aspect of a proposal creates a ground, explosive, or flight safety risk that, either because of its severity and/or expected frequency would require immediate corrective action to alleviate an unacceptable condition.

### 4.2.1 Alternative A

#### 4.2.1.1 *Ground Safety*

Under Alternative A, additional Predator medium altitude (MQ-1) UAVs would be beddown at ISAFAF. Additionally, Predator high altitude (MQ-9) UAVs would be added when this system achieves Initial Operational Capability (IOC). To support all of the units at ISAFAF, a total of 68 MQ-1 aircraft and eight MQ-9 aircraft would be assigned to units at ISAFAF. All assigned aircraft would be flown at ISAFAF, although some aircraft may be rotated to coffins for storage and for ready deployment.

The fire and crash response capability would be improved to meet all requirements. Existing mutual aid agreements currently in effect with abutting communities will remain in effect, thus providing additional response support should it be required.

To support the proposed assignment of additional Predator UAVs, construction of new facilities would be required. Additionally, some existing facilities would be modified and/or upgraded to better satisfy operational, logistic, and safety requirements. However, no construction or modification activities would involve any unusual or extraordinary techniques. During

construction, best management practices would be employed, and standard industrial safety requirements and procedures would be enforced, thereby minimizing any safety risks associated with these activities.

All proposed new facilities would be sited so as to comply with all safety guidelines prescribed by Unified Facilities Criteria (UFC) pertaining to *Airfield and Heliport Planning and Design*.

Implementation of this alternative would involve ground activities that could expose workers performing the required site preparation, grading, and building construction to some risk. The U.S. Department of Labor (DOL), Bureau of Labor Statistics maintains data analyzing fatal and non-fatal occupational injuries based on occupation. Due to the varying range of events classified as non-fatal injuries, the considerations described below focus on fatal injuries since they are the most catastrophic. Data are categorized as incidence rates per 100,000 workers employed (on an annual average) in a specific industry (Standard Industrial Classification [SIC]).

In the assessment of relative risk associated with this proposal, it was assumed that the industrial classifications of workers involved are the Construction Trades (SIC-15, 16, and 17). Based on DOL data and considerations of worker exposure, a fatal injury would be statistically predicted to occur over the range of once every 70 to 190 years, depending on the specific labor classification. This equates to a probability of a fatal injury of from 1.2 to 3.1 out of 10,000 (USDOL 2001). Although DoD guidelines for assessing risk hazards would categorize the hazard category as "catastrophic" (since a fatality would be involved), the expected frequency of the occurrence would be considered "remote" (MIL-STD-882). While the potential result must be considered undesirable, risk is low. Strict adherence to all applicable occupational safety requirements would further minimize the relatively low risk associated with these construction activities.

#### 4.2.1.2 Explosive Safety

Under Alternative A, facilities and infrastructure supporting munitions storage, handling, maintenance, and movement would be enhanced. One new munitions storage structure would be built at ISAFAP, and three new structures would be built at the munitions storage area at Nellis AFB. These structures would be earth-covered igloos, approximately 80 feet by 30 feet. The facilities would be sited so that the Quantity-Distance (safety) arc for the quantity of explosives stored would have no encroachment.

Approximately 50 Hellfire air-to-ground missiles per year currently are expended in conjunction with Predator training operations. Under Alternative A or Alternative B, missile expenditure would increase to 140 per year; under Alternative C, Hellfire use would increase to 100 per year. The transport of Hellfire missiles by truck convoy from storage at Nellis AFB to ISAFAP would increase from the current two to three convoys per year to up to eight per year under Alternative A or Alternative B and to four to five per year under Alternative C.

Whenever the Predator is armed with ordnance, it flies only in Restricted Airspace associated with the NTTR (personal communication, Anderson 2003). Therefore, no additional explosive safety risk to the public is associated with this activity.

### 4.2.1.3 Flight Safety

As discussed in section 3.2, since 1997 the Predator (RQ-1) has flown approximately 31,503 hours. During that time, the aircraft has been involved in 13 Class A mishaps, which include 12 aircraft destroyed (AFSC 2003). This equates to a Class A mishap rate per 100,000 flying hours of 41.27, and an aircraft destroyed rate of 38.09. These rates are high, however, they are not unusual for an aircraft in the early stages of its operational life. With a base of relatively few flying hours, a single accident has a significant impact on the computed rate. Also, as the aircraft matures and greater experience is gained in operating and maintaining it, fewer mishaps occur. As a comparison, during the first 5 years of its operational life, F-16 aircraft demonstrated a Class A mishap rate of 43.61 and a destroyed aircraft rate of 21.80 per 100,000 flying hours. Current rates for the F-16 aircraft are 4.19 and 3.96, respectively (AFSC 2003).

Based on current data, 1,254 Predator sorties are flown annually. If an average Predator sortie is six hours in duration, a Class A mishap would be statistically predicted to occur approximately once every 3.9 months. Under Alternative A, 3,948 Predator sorties would be flown annually for an estimated total of 23,688 flight hours. These operations include MQ-9 sorties, for which no safety data are available. However, for assessment, MQ-1 data will be used. At this level of operation, a Class A mishap would be statistically predicted to occur once every 1.2 months. However, based on the discussion above, this is a conservative estimate, and considering historic trends, the number of mishaps involving the Predator would reasonably be expected to decrease as more experience is gained with its operation.

The Predator is an unmanned vehicle; therefore, no Air Force flight crews are at risk in a Class A mishap. Furthermore, since the vast majority of the vehicle's flying time is accomplished in Restricted Airspace, minimal public exposure to risk would occur. The runway extension and operational limitations (no munitions) for south launch on Runway 13/31 would also serve to protect public safety.

As discussed in section 3.2, the general absence of attractant habitat throughout the region results in minimal risk from bird-aircraft strikes.

### 4.2.2 Alternative B

The proposals concerning procedures, facilities, and infrastructure changes, modifications, and improvements associated with Alternative A are also proposed under Alternative B. Therefore, in terms of ground and explosive safety issues, the assessments presented above remain the same for this alternative.

Under Alternative B, the 68 MQ-1 and 20 MQ-9 Predators would generate 4,680 sorties annually, for an estimated flight time of 28,080 hours. At this level of operation, a Class A mishap would be statistically predicted to occur once every 1.1 months. Based on the discussion above, risk to the public from flying mishaps is considered minimal.

### 4.2.3 Alternative C

The proposals for procedures, facilities, and other modifications at ISAFAP are consistent with construction at a normal military installation. Alternative C ground and safety issues would be

projected to be equivalent to the No Action Alternative. The installation fire protection systems would not be upgraded.

Under Alternative C, the 28 MQ-1 and 20 MQ-9 Predators would generate 1,510 Predator sorties annually for an estimated flight time of 9,060 hours. At this level of operation, a Class A mishap would be statistically predicted to occur once every 3.2 months. This is not substantively different from existing operations and would have no safety consequences. The increase in Hellfire missile use from 50 to 100 annually will require management changes in storage at existing bunkers because no new bunkers are constructed under Alternative C. An additional three annual shipments of Hellfire missiles from Nellis AFB to ISAFAP would follow existing procedures and routes. These established procedures and routes have been, and are expected to be, able to safely transport the additional munitions.

#### **4.2.4 No-Action Alternative**

Under the No-Action Alternative, military construction projects would occur at ISAFAP as they do at an active installation. There would be no beddown projects constructed. Any operational and safety enhancements that would result from beddown would not be realized. Current operations and maintenance activities would continue. Ground, explosive, and flying safety risks would generally remain unchanged.

Under this alternative, 1,254 Predator sorties would fly 7,524 hours annually. At this level of operations, a Class A mishap would be statistically projected to occur once every 3.9 months.



**The armed MQ-1 Predator is an unmanned aircraft in the early stages of its operational life. Hellfire air-to-ground missile usage is projected to increase for any beddown alternative.**

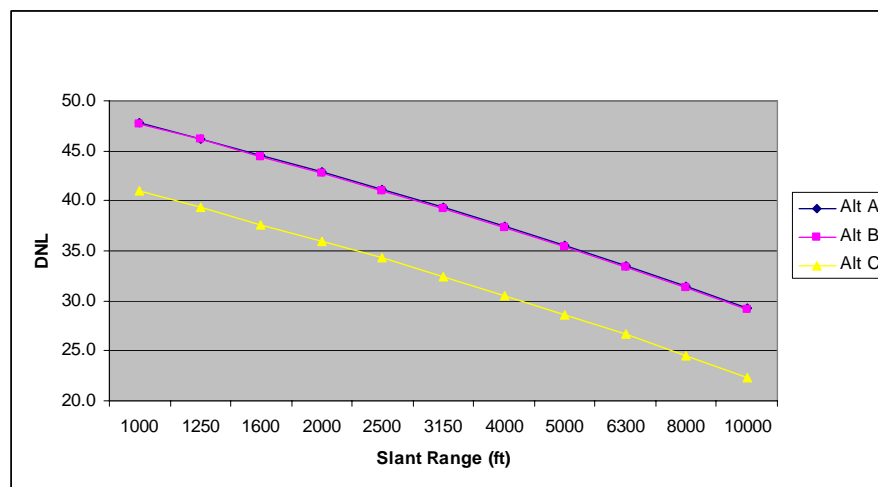
### 4.3 NOISE

The noise models and metrics used in this analysis have been simplified to reflect the small incremental nature of the Proposed Action. By making conservative assumptions, it is possible to predict the maximum increase in noise levels and contour area with available information regarding sortie rates, types of aircraft, and day and night operations.

#### Methodology

##### *ISAFAF Vicinity*

ISAFAF is used by the Thunderbirds demonstration team for training and practice and as a field for Flag and other military aircrew training exercises. Because of the dominance of F-15 and F-16 aircraft noise at the airfield, the mapping of noise contours is not expected to show visible changes for any of the Predator beddown alternatives. The noise emission characteristics of the Predator aircraft and proposed operations at the airfield have been converted into composite Day-Night Average Sound Level (DNL) versus distance curves. The contribution of Predator alternatives to the airfield noise environment is depicted in Figure 4.3-1. Note that the curves for Alternatives A and B are nearly the same and are barely distinguishable on the graph.



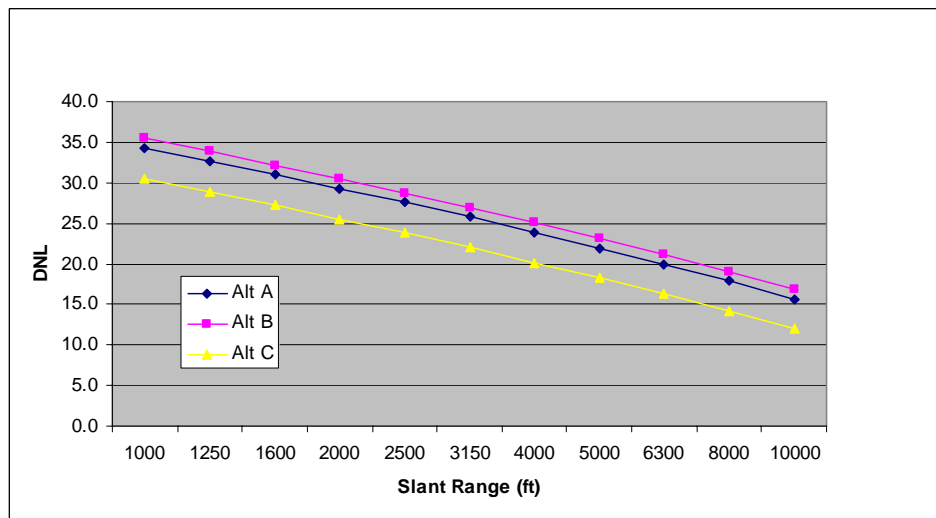
**Figure 4.3-1. Predator Airfield Noise Emissions**

The effect of the proposed activity noise emissions on existing noise contours has been estimated by assuming that the slant range (the diagonal distance from the aircraft in the air to the observer on the ground) from the average Predator aircraft operation to the current DNL 65 contour is less than 1,000 feet. For reference, the DNL 55dB contour was also evaluated at an assumed and conservative reference distance of 5,000 feet (the DNL 55 contour has no land use compatibility implications).

The maximum increase in the respective DNL contours associated with the Predator alternatives does not exceed 0.05dB for any of the alternatives. This level of impact would not be discernable, therefore, is not significant. The analysis predicts an average increase in noise contour area of less than 1 percent. The consequence of Predator beddown on existing noise levels in the vicinity of ISAFAF is not significant and use of additional analysis with the NOISEMAP suite of models is not warranted.

### Range and Vicinity

Airspace noise impacts are known to be not only a function of the number of operations and noise emission characteristics of the proposed aircraft, but the time spent in the airspace and altitude distribution as well. Predator sorties are likely to spend more time in the airspace than other types of conventional sorties, and therefore it is assumed that the average Predator time in the airspace will approach that of all other users combined, amounting to approximately 6 hours per sortie. Predator sorties will cover a wide range of altitudes, with most missions calling for flight activity above 5,000 AGL. For purposes of evaluation, if all Predator sorties were evenly distributed between 1,000 and 10,000 AGL, the DNL values contributed by Predators would be as depicted in Figure 4.3-2. As shown, the proposed number of operations would not contribute more than DNL 36dB from any given altitude.



**Figure 4.3-2. Maximum Airspace DNL Contributions for Predator Alternatives**

The composite effect (total of all noise levels from all 11 altitudes) of Predator operations from all altitudes is 39.1, 40.3, and 35.4 DNL for alternatives A, B, and C, respectively. The extent to which these contributions would influence existing noise levels in the airspace is dependent on the current noise levels on the ground.

The noise levels that would result from the addition of the noise contribution of each of the alternatives at representative DNLs of 55 and 65 would not exceed 1dB for any alternative. This change is not discernable and would produce no discernable impact for any alternative. Additional analysis with the MR\_NMAP noise model, therefore, is not warranted.

#### 4.3.1 Alternative A

As shown in Figure 4.3-1 the noise level contribution of Alternative A is below DNL 50 even at observer distances as close as 1,000 feet. The maximum increase in DNL contour noise level for Alternative A does not exceed 0.05dB, therefore, Alternative A would result in no discernable change to existing noise levels in the vicinity of the airfield. The analysis predicts an average increase in contour area of less than 1 percent. The impact on existing noise levels in the vicinity of the airfield is not significant; and use of additional analysis with the NOISEMAP suite of models is not warranted.

As shown in Figure 4.3-2, the proposed number of operations for Alternative A does not contribute more than DNL 36dB from any given altitude. The composite effect (total of all noise levels from all 11 altitudes) of Alternative A operations from all altitudes is 39.1 DNL. The noise levels that would result from the addition of this noise contribution at the lower and upper end of the range of interest would not exceed 1dB, the noise impact of Alternative A is not significant, and additional analysis with the MR\_NMAP noise model is not warranted.

#### 4.3.2 Alternative B

The additional aircraft associated with Alternative B do not produce a noise effect different from Alternative A. The projected noise level is DNL 50 even at observer distances as close as 1,000 feet. The maximum increase in DNL contour noise level for Alternative A does not exceed 0.05dB. Alternative B would result in no discernable change to existing noise levels in the vicinity of the airfield.

#### 4.3.3 Alternative C

The eight additional aircraft associated with Alternative C are not expected to produce a noise effect discernibly different from the No Action Alternative. The projected DNL contour noise level for Alternative C would not be detectably different from the No Action Alternative.

#### 4.3.4 No-Action Alternative

The No-Action Alternative would result in no change from the existing Predator operations.

### 4.4 AIR QUALITY

Air quality impacts from a proposed activity or action would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- impair visibility within any federally mandated PSD Class I area.

In attainment areas, Prevention of Significant Deterioration (PSD) rules define a stationary source as "major" if annual emissions exceed 250 tons per year of VOCs, NO<sub>x</sub>, CO, SO<sub>x</sub>, or PM<sub>10</sub>. In serious nonattainment areas, New Source Review (NSR) rules define a stationary source as "major" if annual emissions exceed 50 tons of VOCs or NO<sub>x</sub> and 100 tons of CO, sulfur oxides (SO<sub>x</sub>), or PM<sub>10</sub>. Project emissions would be potentially significant if they exceed one of these thresholds. This is a conservative approach, as the project includes both stationary and mobile (non-permitted) emission sources, whereas these thresholds only apply to stationary sources.

According to the USEPA General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal action that has the potential to impact air quality, as described above, in a nonattainment or maintenance area must undergo a conformity analysis. Under this rule, air quality impacts would be potentially significant if project emissions exceed one of the thresholds that trigger a conformity analysis (70 tons per year of PM<sub>10</sub> and 100 tons per year of

CO for CO and PM<sub>10</sub> serious nonattainment areas). A conformity analysis is not required in an attainment area. Since ISAFAF is located outside of the nonattainment area in Clark County, a conformity analysis is not required for activities occurring in the Indian Springs locale. Emissions from the proposed construction of munitions storage structures at Nellis AFB would be potentially significant if they exceed the conformity thresholds described above, since these activities occur in a nonattainment area.

This section summarizes the detailed air quality analysis presented in Appendix D.

#### 4.4.1 Alternative A

A summary of total construction and operational emissions from the implementation of Alternative A at ISAFAF and Nellis AFB are presented in Tables 4.4-1 and 4.4-2. These emissions would not result in long-term impacts on the air quality of Clark County.

**Table 4.4-1. Annual Construction Emissions under Alternative A**

<i>Construction</i>	<i>CRITERIA POLLUTANTS EMISSIONS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub>*</i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
FY 03 Construction Projects (ISAFAF)	12.3	NA	46.3	61.3	3.7
FY 04 Construction Projects (ISAFAF)	6.5	NA	29.8	60.1	2.0
FY 05 Construction Projects (ISAFAF)	7.5	NA	31.4	60.2	2.3
FY 06 Construction Projects (ISAFAF)	9.9	NA	45.7	61.2	3.1
FY 06 Construction Projects (Nellis AFB)	0.4	NA	1.7	0.1	0.1
Emission factor for SO <sub>2</sub> is not available. SO <sub>2</sub> emissions from construction activities, however, are expected to be insignificant.					

**Table 4.4-2. Annual Operational Emissions Increases under Alternative A**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Commuting Vehicles	16.4	0.01	1.7	0.1	2.3
Aircraft Operations (ISAFAF)	103.0	0.1	0.8	0.2	1.8
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9
<b>Total Emissions (ISAFAF)</b>	<b>127.2</b>	<b>2.4</b>	<b>38.2</b>	<b>2.8</b>	<b>6.9</b>

#### 4.4.2 Alternative B

Construction emissions from Alternative B would be the same as for Alternative A (see Table 4.4-1). A summary of total operational emissions from the implementation of Alternative B at ISAFAF and Nellis AFB is presented in Table 4.4-3. These emissions would not result in long-term impacts on the air quality of Clark County.

**Table 4.4-3. Annual Operational Emissions Increases under Alternative B**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Commuting Vehicles	23.3	0.01	2.4	0.2	3.3
Aircraft Operations (ISAFAP)	108.4	0.1	1.7	0.3	2.4
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6
<b>Total Emissions (ISAFAP)</b>	<b>141.5</b>	<b>3.2</b>	<b>49.5</b>	<b>3.7</b>	<b>9.3</b>

**4.4.3 Alternative C**

Total emissions resulting from the implementation of Alternative C at ISAFAP are presented in Tables 4.4-4 and 4.4-5. The implementation of this alternative would result in a decrease of operational emissions of CO, NO<sub>2</sub>, PM<sub>10</sub>, and VOC compared to baseline, and in insignificant emissions of SO<sub>2</sub>. These emissions, therefore, would not result in significant long-term impacts on Clark County air quality.

**Table 4.4-4. Annual Construction Emissions under Alternative C**

<i>Construction</i>	<i>CRITERIA POLLUTANTS EMISSIONS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub>*</i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
FY 03 Construction Projects (ISAFAP)	1.3	NA	1.5	28.2	0.4
FY 05 Construction Projects (ISAFAP)	0.9	NA	1.1	28.1	0.2
FY 06 Construction Projects (ISAFAP)	5.1	NA	21.0	29.6	1.6
* Emission factor for SO <sub>2</sub> is not available. SO <sub>2</sub> emissions from construction activities, however, are expected to be insignificant.					

**Table 4.4-5. Annual Operational Emissions Increases under Alternative C**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Commuting Vehicles	-91.1	-0.04	-9.2	-0.7	-12.9
Aircraft Operations (ISAFAP)	-15.1	0.1	0.9	0.1	0.3
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3
<b>Total Emissions (ISAFAP)</b>	<b>-105.5</b>	<b>0.3</b>	<b>-4.9</b>	<b>-0.3</b>	<b>-12.3</b>

**4.4.4 No Action Alternative**

Under the No Action Alternative, no additional Predator UAV would be added at ISAFAP. Therefore, no construction emissions and no emissions increase or decrease from the operational emissions associated with the current activities would result from this alternative.

## 4.5 GEOLOGY AND SOILS

This section addresses suitability of the proposed site for project construction and operation based on geologic conditions. Principal areas addressed in the analysis include: (1) direct and indirect impacts associated with alteration of topography; (2) erosion potential and permeability of on-site soils; and (3) seismicity.

### 4.5.1 Alternative A

Ground-disturbing activities would involve construction of new or expansion of existing facilities to support the Predator UAV (hangars and shops), trenching of new utility lines, road and gate improvements, and an extension of runway 13/31.

Most of the construction activity at ISAFAF would occur in the northeast portion of the base, which currently consists of primarily disturbed flat land. Much of the area has been previously graded. Excavation would likely be required for much of the new construction due to the potential for caliche and clay lenses at depth. Grading for the extension of the north end of runway 13/31 is in a previously cleared clear zone.

At the Nellis MSA site, substantial cut and fill grading would be necessary as part of the construction of three new munitions igloos and their entrances from Perimeter Road.

*Topography.* All grading and construction at ISAFAF would be completed in accordance with Uniform Building Code (UBC) requirements. In addition, a site-specific geotechnical report is in preparation for the proposed construction areas, and all grading and site preparation would be in accordance with requirements specified in the report. Limited changes would be done to the existing topography and grading would be performed in accordance with UBC Chapter 70 specifications and geotechnical consulting recommendations.

At the Nellis MSA site, cut and fill grading would result in an appreciable change to the existing site topography. The existing rolling hills and Mojave desert topography of the site would be modified for construction pads. Changes in topography would not result in unstable slopes or other geohazards. Grading would be conducted pursuant to established UBC and USAF standards and a detailed geotechnical engineering project plan.

*Erosion.* Site grading, construction of the proposed facilities, road widening, and extension of the runway at ISAFAF would result in temporary soil disturbance. Soils in the project are generally aridisols developed in carbonate parent material from local mountains. They are generally soft and easily erodible. The relatively flat terrain and low precipitation rates would minimize potential construction erosion. Erosion potential would be increased during periods of high winds or storms, especially during construction. Activities would be completed in compliance with geotechnical recommendations, common construction practices, local building permit requirements, and federal and state requirements. Provisions for both temporary and permanent erosion control, such as the use of plastic to cover spoil piles, would be implemented. Control measures would be monitored and maintained to ensure effectiveness. After construction, increased hard surfaces would have the potential to increase runoff and resulting erosion. Design factors will be incorporated into the projects to protect surface areas from erosion.

At the Nellis MSA site, grading could result in erosion of near-surface sediment during construction. Erosion could result in the sedimentation of adjacent drainages and topographic lows. Erosion potential would increase during periods of inclement weather or high winds. To reduce the potential for erosion, construction activities would be in compliance with established design standards, geotechnical recommendations, and all other applicable requirements. After completion of construction, buildings and pads have the potential to increase runoff to adjacent drainages. Construction plans will incorporate design characteristics to minimize erosion potential.

Compliance with established plans and policies and incorporation of standard erosion control measures into project design and construction requirements would reduce erosion potential to less than significant.

*Seismic Hazard.* Active faults located within 60 miles (97 km) of ISAFAP and the Nellis MSA site could result in strong seismically induced ground motion and associated ground shaking. Project designs would incorporate the criteria and requirements for the seismic design of buildings on defense installations set forth in the Department of the Army, Navy, and Air Force technical manual (TM) 5-809-10/NAVFAC P-355/AFM 88-3 Seismic Design for Buildings. Project design would also be in conformance with UBC standards.

#### 4.5.2 Alternative B

Geology and soils consequences associated with Alternatives A and B would be identical. No additional construction, beyond that identified for Alternative A, would be required for Alternative B.

#### 4.5.3 Alternative C

Geology and soils consequences resulting from Alternative C construction activities would be approximately one-half those associated with either Alternative A or Alternative B. The main area of soils disturbance at ISAFAP would be the extension of Runway 13/31 at ISAFAP. Provisions for both temporary and permanent erosion control would be implemented. Site grading and construction of the proposed facilities within the cantonment area would have no substantive effect on geology or soils. No construction would occur at Nellis AFB.

#### 4.5.4 No-Action Alternative

Under the No-Action Alternative, the existing ISAFAP facilities would not be modified and no beddown facilities would be constructed at either ISAFAP or Nellis AFB.

### 4.6 WATER RESOURCES

This section analyzes surface water and groundwater conditions to determine suitability for beddown construction and operation. Principal areas addressed include (1) potential erosion and water quality impacts associated with alteration of surface runoff patterns and (2) potential water supply impacts due to changed water demand.

#### 4.6.1 Alternative A

##### *Surface Water*

Construction-related excavation and grading activities required for Alternative A could potentially impact surface water quality during stormwater run-off and erosion events. Standard erosion control measures will be included in construction procedures. Design and construction would follow all applicable and appropriate regulations and ordinances regarding stormwater retention and treatment.

Additional hard surfaces from structures and paving would have the potential to concentrate rainwater and to increase stormwater run-off and erosion events. Facilities constructed as part of the project would include stormwater runoff control features such as gutters, concrete swales, and culvert drain systems.

##### *Groundwater/Water Supply*

Alternative A includes the addition of 101 personnel at ISAFAF, which would increase water demand at the base. The ISAFAF General Plan (USAF 2003) indicates that current demand on the ISAFAF water system is 88,000 gpd, or approximately 32.1 million gpy (98.6 AFY), for the existing 1,157-person workforce. The addition of 101 personnel would increase water demand to approximately 95,682 gpd or 34.9 million gpy (107.2 AFY). This assumes an average daily usage of 76 gpd per person for all additional project-related personnel. These computations are presented in Table 4.6-1.

**Table 4.6-1. Water Supply Analysis for ISAFAF**

<i>Parameter</i>	<i>Existing</i>	<i>Alternative A</i>	<i>Existing + Alternative A</i>
Personnel	1,157	101	1,258
Daily Usage (gpd per person) <sup>1</sup>	76.06	76.06	76.06
Total Daily Usage (gpd)	88,000 <sup>2</sup>	7,682 <sup>3</sup>	95,682
Total Annual Usage (million gpy/AFY) <sup>4</sup>	32.1/98.6	2.8/8.6	34.9/107.2
1. Approximate daily usage calculated as total daily demand/total personnel. 2. From the ISAFAF General Plan (USAF 2003). 3. Total daily usage calculated as Alternative A personnel x approximate daily per person usage. 4. Total annual usage calculated as total daily usage x 365 days (USAF 1996); 1 acre-foot = 325,851 gallons. Abbreviations: gpd: gallons per day; gpy: gallons per year; AFY: acre-feet per year			

The State of Nevada has authorized pumping of a total of approximately 192.6 AFY (62.7 million gpy) from the three wells (USAF 1998; USAF 2003). Implementation of Alternative A would increase the current water demand at ISAFAF by approximately 8.6 AFY. This increase would be within the State allocation for the ISAFAF wells and would not substantially affect the water supply.

#### 4.6.2 Alternative B

##### *Surface Water*

Surface water effects would be the same as Alternative A.

##### *Groundwater/Water Supply*

Alternative B includes the addition of 143 personnel at ISAFAP. Alternative B would result in an increased water demand of 4.0 million gpy (12.2 AFY). The total demand on the system would be 36.1 million gpy (110.8 AFY). This increase would be within the State allocation for the ISAFAP wells and would not substantially affect the water supply.

A comparison of annual water demands for Alternatives A, B, and C is presented in Table 4.6-2.

#### 4.6.3 Alternative C

##### *Surface Water*

Construction-related excavation and grading associated with Alternative C would be within the existing cantonment area and the extension of Runway 13/31. Additional hard surface areas would have the potential to concentrate rainwater and to increase stormwater runoff.

##### *Groundwater/Water Supply*

Following construction, the 560-personnel reduction associated with Alternative C would result in a lower demand by 47.7 AFY below that of the No-Action Alternative (see Table 4.6-2).

**Table 4.6-2. Comparison of Annual Water Demands for Alternatives A, B, C, and Existing**

<i>Existing Demand (million gpy/AFY)</i>	<i>Existing Demand plus Alternative A (million gpy/AFY)</i>	<i>Existing Demand plus Alternative B (million gpy/AFY)</i>	<i>Existing Demand plus Alternative C (million gpy/AFY)</i>	<i>Current State Allocation (million gpy/AFY)</i>
32.1/98.6	34.9/107.2	36.1/110.8	16.6/50.9	62.7/192.6

#### 4.6.4 No-Action Alternative

Under this alternative, existing ISAFAP facilities would not be modified and Predator beddown facilities would not be constructed. No change in water resources would occur.

### 4.7 BIOLOGICAL RESOURCES

This section analyzes the potential for impacts on biological resources from implementation of the proposed beddown. Ground disturbance from construction, habitat conversion, and increased activity at the ISAFAP and the MSA would be the primary sources of effects on biological resources. The use of Predator aircraft in NTTR airspace does not appreciably change the baseline condition for plants and wildlife and so would not have significant impacts on biological resources.

The significance of potential impacts on biological resources is based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Impacts on biological resources are significant if species or habitats of identified concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of special concern.

#### **4.7.1 Alternative A**

Ground disturbance, conversion of several acres of highly disturbed desert scrub habitat to runway, and the increased activity associated with the project would occur within an existing highly disturbed area at ISAFAF. At the MSA, construction of new storage bunkers would eliminate desert scrub habitat that is less disturbed, but still within the fenced area bounded by the perimeter road at NAFB. Impacts on vegetation and wildlife habitat would be less than significant at both locations because a relatively small area would be affected and the quality of the habitat is poor.

The only special status species with a reasonable likelihood of occurrence within the project footprint at ISAFAF is the burrowing owl. Injury or mortality to burrowing owls, which are protected under the Migratory Bird Treaty Act and Executive Order 13186, could be significant because of the status and sensitivity of the species. The following procedures are recommended by the USFWS to avoid impacting burrowing owls:

If possible, construction will be scheduled outside of the burrowing owl nesting season (March-August). The construction site, including any borrows that may contain burrowing owls, will be surveyed by a qualified biologist prior to construction. Construction will not proceed until the absence of burrowing owls from the construction site has been confirmed, whereupon unoccupied burrows within the construction area may be collapsed and graded to ensure that the site does not attract burrowing owls. During the burrowing owl nesting season (March-August), if nesting burrowing owls are present, the nest site(s) shall be avoided until the owls have completed nesting and vacated the burrow(s) (USFWS 2003).

Desert tortoises could be present in the vicinity of the proposed storage bunkers on the MSA, although the quality of the habitat for tortoises is poor. The following is recommended to avoid potential adverse effects:

The area surrounding the construction site will be surveyed for desert tortoises according to the USFWS (1992) protocol. If tortoises are present or deemed likely to be present (on the basis of sign) in the area surrounding the construction site, construction activities will be monitored by a qualified biologist to ensure that tortoises do not enter the site. The construction site itself will be intensively surveyed by a qualified biologist prior to construction. Construction will not proceed until the absence of desert tortoises from the construction site has been confirmed. The Air Force will consult with USFWS regarding the relocation of any tortoises found to occur in the construction area.

With the above procedure, Alternative A would have no significant impacts.

##### 4.7.2 Alternative B

For purposes of the biological resources analysis, Alternative B is essentially the same as Alternative A. As with Alternative A, no significant impacts on biological resources are expected given the incorporation of the above procedures to avoid impacts on desert tortoise and burrowing owls.

##### 4.7.3 Alternative C

Alternative C results in a total area disturbed that is approximately one-half that of either Alternative A or Alternative B. Under Alternative C, no significant impacts on biological resources are expected, given the incorporation of procedures to avoid consequences to desert tortoises and burrowing owls.

##### 4.7.4 No-Action Alternative

No Predator beddown ground disturbance would occur to potentially affect biological resources.

#### 4.8 CULTURAL RESOURCES

Impacts on cultural resources are considered significant if a resource fulfilling any of the National Register criteria would be physically damaged or altered, would be isolated from the context considered significant, or would be affected by project elements that would be out of character with the significant property or its setting. If archaeological artifacts or features, or human remains are discovered during construction, all construction activities must cease and the Environmental Management Flight Chief and the NAFB Archaeologist must be notified immediately (NAFB 1998).

##### 4.8.1 Alternative A

###### *ISAFAF*

Section 106 of the NHPA requires that Federal agencies take into account the effects of their undertakings on historic properties. The Area of Potential Effect (APE) for the construction of new facilities related to the proposed action was inventoried and evaluated as part of an archeological survey of the entire ISAFAF facility. No significant or potentially significant archeological resources are recorded within the APE, and, therefore, no adverse impacts on archeological sites would occur with the implementation of the proposed action.

ISAFAF has no significant or potentially significant historic structures related to either World War II or the Cold War era (see section 3.8 for more details). Therefore, no adverse impacts on historic properties would occur through the modification of existing structures related to the proposed action.

ISAFAF has no recorded significant traditional resources (see section 3.8 for more details). Therefore, no adverse impacts on traditional resource would occur from the proposed action.

### ***Nellis AFB***

No significant or potentially significant archeological or traditional resources are recorded within the APE for the construction of three new munitions storage structures at Nellis AFB, and, therefore, no adverse impacts on archeological or traditional resources would occur with the implementation of the proposed action. No existing structures at Nellis AFB would be modified with implementation of the proposed action.

#### **4.8.2 Alternative B**

Alternative B construction would be the same as Alternative A. No adverse impacts would occur to archaeological, historic, or traditional resources.

#### **4.8.2 Alternative C**

Impacts on cultural resources under Alternative C would involve reduced construction of new facilities as compared with Alternative A or Alternative B. No adverse impacts on cultural resources would occur at either ISAF AF or Nellis AFB.

#### **4.8.4 No-Action Alternative**

No predator beddown ground disturbing activities would occur and no existing buildings would be modified.

### **4.9 VISUAL RESOURCES**

Potential visual impacts are evaluated in terms of landscape character, visual sensitivity, and visual dominance. The latter refers to the degree to which a change in the visual setting is subordinate to or dominates views. Aesthetic impacts would be considered significant if the proposed project were incompatible with the existing visual character of off base lands and were visible from sensitive areas that are generally accessible to the public, e.g., off base residences or scenic highways.

#### **4.9.1 Alternative A**

The primary visual impacts of Alternative A would be the new construction at ISAF AF. Most of the proposed new construction at ISAF AF would be visible to the traveling public on Highway 95. It would also be visible from some locations in the town of Indian Springs. The largest new buildings would be the two hangars to be constructed for 11 RS and 15 RS. Each would be approximately 30 feet high and approximately 200 feet long. They would be located a little over 1 mile away from the highway and at a site that is about 15 feet lower in elevation than the nearest part of the highway. At this distance, and with a somewhat lower elevation, they would not appear as very imposing structures to the viewing public.

All of the other new facilities are similar in scale and location to structures already in place at ISAF AF. They would “fit in” with their visual surroundings on the base and would not likely be even noticed by most people. New construction at ISAF AF would have some visual impact, but it would be less than significant given the context, location, and scale.

#### 4.9.2 Alternative B

The visual consequence of Alternative B would be the same as Alternative A.

#### 4.9.3 Alternative C

Alternative C would result in no new construction at ISAFAF to the northeast of the existing cantonment area. Most of the proposed new construction would not be noticeable to the traveling public on Highway 95. Given the context, location, and scale of the new facilities, there would be no visual impact on ISAFAF resulting from implementation of Alternative C.

#### 4.9.4 No-Action Alternative

The No-Action Alternative would result in no change from the existing condition. The additional aircraft operations would not occur and new facilities would not be built as part of the proposed action.



**New buildings proposed for construction under Alternative A or Alternative B would be east of these pictured buildings. Construction under Alternative C would add two buildings within the pictured cantonment area.**

### 4.10 LAND USE

This section analyzes impacts of the proposed action and alternatives on land use patterns and land management plans. Analysis requires identification of management plans and use areas, followed by determination of potential effects due to construction and changes in operations.

#### **4.10.1 Alternative A**

##### ***Land Use Compatibility***

Implementation of Alternative A would require approximately 30 construction projects plus upgrades at ISAFAF and three munitions storage facilities at Nellis AFB (see Table 2-4). These projects would comply with existing land uses, because each project has been sited to facilitate functionality and increase operational capacities to support the beddown of additional Predator UAVs. Consequently, each construction component of Alternative A is inherently consistent with ISAFAF planning policies and guidelines and would be designed and sited to be compatible with existing land use.

Development under Alternative A would result in construction of Predator support facilities including two operations/maintenance hangars and a fuel maintenance facility near Runway 13/31. The location of these aircraft operations and maintenance facilities are in compliance with the conclusions of the Functional Relationships Analysis (see section 3.10.2).

##### ***Land Management Plans***

Development under Alternative A would require extension of Runway 13/31. The existing flightline would need to be extended to meet Class A requirements. Clear zone grading associated with the proposed extension of Runway 13/31 would extend somewhat beyond the ISAFAF north boundary fence. The ISAFAF fence separates the ISAFAF cantonment area from the rest of NTTR. The areas on both side of the fence were withdrawn for military use pursuant to PL 106-65. The boundary of DNWR extends east to west along the perimeter of the ISAFAF boundary fence and a portion of the munitions storage area and the graded portion of the Runway 13/31 clear zone already extend into the DNWR. The proposed extension of Runway 13/31 would not be different from, or result in incompatibilities with, existing land uses. There would be no change in land use from that which currently occurs in the general area.

#### **4.10.2 Alternative B**

Under Alternative B, the impacts on land use and land management plans would be the same as for Alternative A.

#### **4.10.3 Alternative C**

All construction under Alternative C would be in existing areas compatible with existing land use. The extension of Runway 13/31 is in a current runway overrun area. The structures would be within the existing ISAFAF cantonment area. Alternative C is compatible with existing land uses and consistent with existing management plans.

#### **4.10.4 No-Action Alternative**

Land use and land status near ISAFAF and Nellis AFB would remain as described for baseline. All operations would continue as under current conditions.

## 4.11 SOCIOECONOMICS

The socioeconomic consequences most likely to be noticed are those associated with a change in military personnel and their dependents and any others associated directly and indirectly with the proposed activities at ISAF AF. An influx would be persons who would not reside in the region in the absence of the project. A distinction is made between “project-related” population and “in-migrant” population. The former refers to those persons (of all ages) who are in some manner related to implementation of the project including workers and their dependents expected to contribute to the project but who currently reside in the region. In-migrants are persons who are in some manner related to implementation of the project, but who do not currently reside in the region and move to the region in response to implementation. It is impacts associated with this latter group that are the focus here.

Alternative A or Alternative B calls for additional military personnel assigned to ISAF AF. No additional civilian or contract employees are identified. Additional military personnel are assumed to come to the Nellis AFB/ISAF AF region from elsewhere in the nation. Depending upon the marital and family status of these personnel, they (and their family members) would have differing needs and, thus, impacts on local and regional socioeconomic resources. As examples: some would be assigned to housing (accompanied or unaccompanied) on, or controlled by, Nellis AFB; and some would have school-age children who would be enrolled in local schools. The analysis of impacts takes such variations into account. Alternative C would see a reduction in the number of military personnel assigned to ISAF AF.

Sizeable construction activity is proposed under Alternative A or Alternative B at ISAF AF over a 1-to-3-year period (FY04, FY05, and FY06). More limited construction would occur under Alternative C. This construction activity would stimulate the local and regional economy and provide employment through the use of local and regional companies. Most of the workers associated with this construction activity are assumed to reside within the Las Vegas area. A small proportion of construction could be attracted to the area from elsewhere.

An introduction of both new personnel and construction activity into the region would increase the number of business transactions taking place. This is related to the acquisition of goods and services and the consumption expenditures of the additional persons. A reduction in personnel would have a reverse effect.

A summary comparison of potential impacts associated with implementation of each of the alternatives is presented in Table 4.11-1 found at the end of this section. The table compares employment, population, housing, and public school enrollment for the construction and operations phases of the proposed project.

### 4.11.1 Alternative A

#### *Employment*

The number of jobs directly and indirectly associated with the actions proposed under Alternative A during the construction phase would peak in FY06 with about 765 new jobs (101 military, 125 secondary, and 539 construction). Over the long term (operations phase) employment would stabilize at 226 jobs (101 military and 125 secondary).

The additional jobs created during the peak year of the proposed project can be compared to the number of jobs that have been created, on average, each year in Clark County over the period 1990-2000. The project-related jobs peak would number 765, compared to the county average annual growth of almost 40,000 jobs, i.e., just under 2 percent.

The addition of 101 military positions to the active duty members and civilian contractors located at ISAFAF would represent a relatively small increase (10.9 percent) over the current total of 925 personnel. Essentially all personnel currently assigned to ISAFAF reside in the Las Vegas metropolitan area located over 35 miles to the southeast. These personnel commute to their workplace using a combination of private cars, carpool vehicles and busses. It is unlikely that new personnel would choose to reside in the community of Indian Springs (located adjacent to ISAFAF on the south side of U.S. Highway 95) since the housing and public and private services are limited. Secondary jobs are primarily expected to locate in the Las Vegas area, although a limited number of service jobs could be created in the Indian Springs area.

### ***Population***

Project-rated population would peak during the construction phase in FY06 at 2,094 persons comprised of 225 military personnel and their dependents, 352 secondary workers and their family members, and 1,517 construction workers and their family members. During the operations phase of the project, the number of project-related persons would fall and stabilize at 577 (225 military personnel and their dependents and 352 secondary workers and their family members).

It is projected that potential in-migration would peak in FY06 with 411 persons, the majority of whom (225 persons) would be military personnel and their dependents. Over the long term, in-migrants are expected to stabilize at 260, of which 225 are military-related persons.

It is estimated that the majority, but not all, in-migrating persons would reside in communities in the vicinity of Nellis AFB such as North Las Vegas and Las Vegas. It is anticipated that this number would peak at 331 in FY06 and stabilize over the long term at 254.

Over the period 1990-2001, the resident population of Clark County has increased, on average, by over 65,000 per year. The population of the City of Las Vegas has increased by an average of 21,350 per year over the same period and that of the City of North Las Vegas by over 7,000 persons. The peak year addition of 412 persons represents a small proportion of such recent population increases.

### ***Housing***

It is anticipated that the demand for housing located in the communities adjacent to Nellis AFB and ISAFAF would peak in FY06 with 153 dwelling units, the majority of which (86 units) would be needed by military personnel (both accompanied and unaccompanied). Over the long term, the demand for housing would level off at 99 dwelling units.

Over the period 1990-1999, an average of 24,200 housing units were authorized for construction each year in Clark County. The corresponding numbers for the City of Las Vegas and City of North Las Vegas were 8,340 and 2,180, respectively. These additions to the housing stock compare to a potential demand for 153 off-base housing units during the peak year.

The number and quality of housing in the community of Indian Springs, which is located adjacent to ISAFAF, is not likely to encourage active duty personnel and their dependents to reside there. The community has few employment opportunities (the largest being the combined elementary/middle/high school) that could provide employment opportunities for dependents. Additionally, residing in Indian Springs would require a commute (of over 35 miles) to the Las Vegas metropolitan area and/or Nellis AFB to a place of work as well as trips for everyday goods and services.

##### *Public Schools*

The number of school-age children entering public schools could number 86 during the construction phase and stabilize at 63 over the long term. The large majority of these children are family members of military personnel, most of whom reside off-base.

The potential numbers of additional pupils entering the Clark County School District as a result of implementation of the project are small in comparison to the growth in enrollment that has been taking place in the past years. Between school years 2000-2001 and 2001-2002 enrollment in the district increased by over 13,500 students. Potential impacts would represent less than 1 percent of this annual growth.

In the absence of any sizeable increase in the population of the community of Indian Springs, any impacts on the combined elementary/middle/high school would be negligible.

#### **4.11.2 Alternative B**

##### *Employment*

The number of jobs directly and indirectly associated with the actions proposed under Alternative B during the construction phase would peak in FY06 with about 859 new jobs (143 military, 177 secondary, and 539 construction). Over the long term (operations phase) employment would stabilize at 320 jobs (143 military and 177 secondary).

The additional jobs created during the peak year of the proposed project can be compared to the number of jobs that have been created, on average, each year in Clark County over the period 1990-2000. The project-related jobs would number 860, compared to the county average annual growth of almost 40,000 jobs, i.e., just over 2 percent.

The addition of 143 military positions to the active duty members and civilian contractors located at ISAFAF would represent a relatively small increase (15.5 percent) over the current total of 925 personnel. Virtually all personnel currently assigned to ISAFAF reside in the Las Vegas metropolitan area located over 35 miles to the southeast. These personnel commute to their workplace using a combination of private cars, carpool vehicles and busses. It is unlikely that new personnel would choose to reside in the community of Indian Springs (located adjacent to ISAFAF on the south side of U.S. Highway 95) since the housing available in the community is comprised predominantly of mobile homes and public and private services are limited.

### ***Population***

Project-rated population would peak during the construction phase in FY06 at 2,334 persons comprised of 318 military personnel and their dependents, 498 secondary workers and family members, and 1,517 construction workers and family members. During the operations phase of the project, the number of project-related persons would fall and stabilize at 817 (318 military personnel and their dependents and 498 secondary workers and family members).

It is projected that potential in-migration would peak in FY06 with 520 persons, the majority of whom (318 persons) would be military personnel and their dependents. Over the long term, in-migrants are expected to stabilize at 368, of which 318 are military-related persons.

It is estimated that the majority, but not all, in-migrating persons would reside in communities in the vicinity of Nellis AFB such as North Las Vegas and Las Vegas. It is anticipated that this number would peak at 405 in FY06 and stabilize over the long term at 254.

Over the period 1990-2001, the resident population of Clark County has increased, on average, by over 65,000 per year. The population of the City of Las Vegas has increased by an average of 21,350 per year over the same period and that of the City of North Las Vegas by over 7,000 persons. The peak year addition of 520 persons represents a small proportion of such recent population increases.

### ***Housing***

It is anticipated that the demand for housing located in the communities adjacent to Nellis AFB and ISAFAP would peak in FY06 with 194 dwelling units, the majority of which (122 units) would be needed by military personnel (both accompanied and unaccompanied). Over the long term, the demand for housing would level off at 140 dwelling units.

Over the period 1990-1999, an average of 24,200 housing units were authorized for construction each year in Clark County. The corresponding numbers for the City of Las Vegas and City of North Las Vegas were 8,340 and 2,180, respectively. These additions to the housing stock compare to a potential demand for 194 off-base housing units during the peak year.

The number and quality of housing in the community of Indian Springs, which is located adjacent to ISAFAP, is not likely to encourage active duty personnel and their dependents to reside there. The community has few employment opportunities (the largest being the combined elementary/middle/high school) that could provide employment opportunities for dependents. Additionally, residing in Indian Springs would require a daily commute (of over 35 miles) to the Las Vegas metropolitan area and/or Nellis AFB to a place of work as well as trips for everyday goods and services.

### ***Public Schools***

The number of school-age children entering public schools could number 112 during the construction phase and stabilize at 89 over the long term. The large majority of these children are family members of military personnel, most of whom reside off base.

The potential numbers of additional pupils entering the Clark County School District as a result of implementation of the project are small in comparison to the growth in enrollment that has been taking place in the past years. Between school years 2000-2001 and 2001-2002, enrollment in the district increased by over 13,500 students. Potential impacts would represent less than 1 percent of this annual growth.

In the absence of any sizeable increase in the population of the community of Indian Springs, any impacts on the combined elementary/middle/high school would be negligible.

#### **4.11.3 Alternative C**

##### ***Employment***

Under Alternative C there would be substantially less construction activity than under other beddown alternatives and a reduction of 560 active duty military personnel assigned to ISAFAP. The modest employment associated with construction of facilities (190 workers during FY06) would be offset by the reduction in military personnel (560 persons) and the associated reduction in secondary employment (694 jobs) in the regional economy associated with their presence. The net result would be a reduction in employment in FY06 of 1,064 jobs. Over the long term (operations phase) regional employment would be reduced by 1,254 jobs (560 military and 694 secondary).

It is unlikely that this reduction in regional employment would be detectable in the Las Vegas metropolitan area, especially given the current and expected future employment trends. Virtually all personnel currently assigned to ISAFAP reside in the Las Vegas metropolitan area located over 35 miles to the southeast. These personnel commute to their workplace using a combination of private cars, carpool vehicles and busses. It is unlikely that this anticipated reduction in personnel would affect the community of Indian Springs (located adjacent to ISAFAP on the south side of U.S. Highway 95) since the housing and public and private services present here are very limited. Secondary job losses are expected to occur within the Las Vegas metropolitan area.

##### ***Population***

It is projected that regional population would decline by 1,442 over the long term, the majority of whom (1,246 persons) would be military personnel and their dependents. It is estimated that the majority of out-migrating persons currently reside in communities in the vicinity of Nellis AFB such as the cities of North Las Vegas and Las Vegas.

Over the period 1990-2001, the resident population of Clark County has increased, on average, by over 65,000 per year. The population of the City of Las Vegas has increased by an average of 21,350 per year over the same period and that of the City of North Las Vegas by over 7,000 persons. The loss of 1,442 persons would not noticeably affect population change in the region.

##### ***Housing***

With the reduction in personnel, it is anticipated that a number of housing units would be vacated, especially in the communities adjacent to Nellis AFB. The potential number of housing units vacated would be approximately 550. Over the period 1990-1999, an average of 24,200

housing units were authorized for construction each year in Clark County. The corresponding numbers for the City of Las Vegas and City of North Las Vegas were 8,340 and 2,180, respectively. The reduction in demand for new housing associated with the population loss would not noticeably affect residential construction activity in the region.

The reduction in population is not expected to affect housing resources in the community. Any on-base housing units would be vacated. These units would then become available to other military personnel and their families.

#### *Public Schools*

The reduction in the number of school-age children in public schools could number almost 350 over the long term. The large majority of these children are family members of military personnel, most of whom reside off base.

The potential number of pupils leaving the Clark County School District as a result of implementation of the project is small (0.1 percent) in comparison to the enrollment of 244,684.

#### **4.11.4 No-Action Alternative**

Under the No-Action Alternative, existing and projected conditions would be unaffected. Those conditions are described for each respective socioeconomic resources in section 3.11.

#### **4.11.5 Comparison of Alternatives**

A comparison of potential impacts associated with implementation of each of the alternatives is presented in Table 4.11-1. The table compares employment, population, housing, and public school enrollment for the construction and operations phases of the proposed project.

**Table 4.11-1. Comparison of the Socioeconomic Impacts of the Alternatives**

<i>Resource</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>No-Action Alternative</i>
Employment (jobs)	Construction Phase: Direct: 101 Secondary: 125 Construction: 539 Total: 765 Long-Term: Direct: 101 Secondary: 125 Total: 226	Construction Phase: Direct: 143 Secondary: 177 Construction: 539 Total: 859 Long-Term: Direct: 143 Secondary: 177 Total: 320	Construction Phase: Direct: -560 Secondary: -694 Construction: 190 Total: -1,064 Long-Term: Direct: -560 Secondary: -694 Total: -1,254	Future growth and change in employment in the region is expected to continue in the absence of the proposed project.
In-Migrating Population (persons)	Construction Phase: Direct: 225 Secondary: 35 Construction: 151 Total: 411 Long-Term: Direct: 225 Secondary: 35 Total: 260	Construction Phase: Direct: 318 Secondary: 50 Construction: 151 Total: 520 Long-Term: Direct: 318 Secondary: 50 Total: 368	Construction Phase: Direct: -1,246 Secondary: -195 Construction: 53 Total: -1,388 Long-Term: Direct: -1,246 Secondary: -195 Total: -1,442	Future growth in resident population in the region is expected to continue in the absence of the proposed project.

**Table 4.11-1. Comparison of the Socioeconomic Impacts of the Alternatives (continued)**

<i>Resource</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>No-Action Alternative</i>
Off-Base Housing (dwelling units)	Construction Phase: Direct: 86 Secondary: 13 Construction: 54 Total: 153 Long-Term: Direct: 86 Secondary: 13 Total: 99	Construction Phase: Direct: 122 Secondary: 18 Construction: 55 Total: 194 Long-Term: Direct: 122 Secondary: 18 Total: 140	Construction Phase: Direct: -478 Secondary: -69 Construction: 19 Total: -528 Long-Term: Direct: -478 Secondary: -69 Total: -547	Future growth of the regional housing stock is expected to continue in the absence of the proposed project.
Public School (students)	Construction Phase: Direct: 58 Secondary: 5 Construction: 23 Total: 86 Long-Term: Direct: 58 Secondary: 5 Total: 63	Construction Phase: Direct: 81 Secondary: 8 Construction: 23 Total: 112 Long-Term: Direct: 81 Secondary: 8 Total: 89	Construction Phase: Direct: -319 Secondary: -30 Construction: 8 Total: -341 Long-Term: Direct: -319 Secondary: -30 Total: -349	Future growth in enrollment in the Clark County School District is expected to continue as employment and population rise in the absence of the proposed project.

## 4.12 ENVIRONMENTAL JUSTICE

The intent of environmental justice analysis includes determining whether the project has the potential to:

- Degrade the health and safety of low-income or minority communities disproportionately when compared to the regional population;
- Cause a disproportionately high and adverse impact on members of low-income or minority communities adjacent to the area of the proposed action; or
- Fail to provide for or encourage effective participation of members of low-income or minority communities adjacent to the area of the proposed action in the associated environmental review and decision-making process.

The identification of potential disproportionately high project-related environmental impacts on minority and low-income populations is achieved through consideration of all adverse project-related environmental impacts with respect to the affected population.

The proposed Predator beddown has been subject to public participation as required under NEPA. To facilitate public involvement in this project, the Air Force prepared and issued a Notice of Intent (NOI) to prepare an EA for Predator force structure changes at ISAFAP. The NOI was first published in the Las Vegas Review-Journal on 20 February 2003. A second NOI was published on 21 March 2003. The U.S. Air Force has requested assistance from agencies and the general public in identifying issues or areas of concerns for this environmental analysis.

### 4.12.1 Alternative A

The proposed beddown would change the operational facilities located within the jurisdiction of the Air Force and would not expand outside of lands withdrawn for military activities. The beddown and military training of Predator assets would not create additional health and safety

impacts on the nearby community of Indian Springs. Because Indian Springs has a lower and/or equivalent percentage of minorities and individuals living below the poverty level compared to Clark County and the state of Nevada, low-income or minority populations would not be affected disproportionately by any adverse effects resulting from the proposed action.

#### **4.12.2 Alternative B**

Under Alternative B, the impacts on minority and low-income populations would be the same as described in section 4.12.1 for Alternative A. No adverse impacts would occur.

#### **4.12.3 Alternative C**

The reduction in Predator-related personnel at ISAFAF would not be expected to have disproportionate impact on low income or minority populations in the Region of Influence.

#### **4.12.4 No-Action Alternative**

Under the No-Action Alternative, Predator operations at ISAFAF would not change.

### **4.13 INFRASTRUCTURE**

The following sections describe potential impacts on infrastructure that would result from the proposed beddown. Infrastructure elements examined include fire protection, police protection, water supply, wastewater collection and treatment, stormwater drainage, electricity, and communications.

#### **4.13.1 Alternative A**

##### ***Fire Protection***

The current fire protection system at ISAFAF is degraded and sufficient capacity does not exist to support additional Predator assets and associated personnel. However, development under Alternative A would involve improvements to the existing fire protection system. Under Alternative A, the construction of new facilities (i.e. new hangars, support buildings, and storage facilities) would require a new water storage tank and pump house with fire pumps.

The addition of new support facilities would require a new Fire Reporting and alarm system. The new hangar would have 360-degree fire suppression access and would be equipped with a low-level high expansion foam fire suppression system.

All new facility designs would accommodate the turning radius of the crash rescue apparatus. In addition, fire hydrants would be placed at the corners of all new facilities and would be sited in conformance with Engineering Technical Letter (ETL) criteria (USACE 2003).

All fire protection system improvements would be in conformance with the Uniform Facilities Criteria and ETL 02-15, Fire Protection Engineering Criteria – New Aircraft Facilities (U.S. Air Force Civil Engineer Support Agency 2001). Extension of existing fire system components and regulation of new building designs would result in adequate fire suppression services to support additional Predator assets at ISAFAF. The addition of new fire support facilities would be beneficial to ISAFAF and the immediate region.

### ***Police Protection***

Implementation of Alternative A would result in an increase of 101 personnel at ISAFAF, which would cause a small increase in demand for police protection services. With the NTTR security personnel stationed at ISAFAF, however, sufficient police protection services exist at ISAFAF to support the increased personnel.

### ***Water Supply***

The proposed construction activities at ISAFAF would not significantly add to the use of potable water. Alternative A includes the addition of 101 personnel at ISAFAF to support increase of Predator assets. A water line extension would be provided to support new facilities constructed east of Runway 13/31 (see Figure 4.3-1). The increased water demand at ISAFAF would be within the state allocation and would not substantially affect water supply.

### ***Wastewater Collection and Treatment***

The ISAFAF wastewater collection system would be expanded to meet the requirements of the proposed beddown. An extension of the existing system would be constructed to support new facilities constructed east of Runway 13/31 (see Figure 4.13-1). The existing wastewater treatment plant was designed with sufficient excess capacity to handle triple the current peak flows (see section 3.13.4).

### ***Stormwater Drainage***

The existing stormwater drainage system is considered inadequate to handle large amounts of water during occasional severe storms. Construction of hard surfaces could increase runoff and improvements in drainage associated with the construction would alleviate some existing inadequacies.

### ***Electricity***

Under Alternative A, a new 12.47 kV electrical substation would be installed near the East Gate (see Figure 4.13-1). Nevada Power Company would provide primary service (i.e., primary transformer protection and switching) to the new substation. ISAFAF would provide all secondary transformer protection and distribution (USACE 2003). The existing electrical system, with the construction of a new electrical distribution system, would be sufficient to provide adequate electrical services required for the maintenance and operation of additional Predator UAVs.

### ***Communications***

Under Alternative A, the existing communication system would be extended to serve the new facilities. The existing communication duct bank would be extended from the existing manhole MH13. This extension would be provided to the new communication room located east of Runway 13/31 (Figure 4.13-1). In addition, a vault would be installed outside of the new communication room in order to support the main duct bank. The GCS Facility would require additional conduits to support GCS antennas. A communication closet would be provided at the flight line end of the hangar for GCS equipment. All new facilities would require individual

satellite antennas for CATV requirements. New communication facilities would be designed in accordance with standards delineated in TLA/EIA 568A (USACE 2003). Planned communication system improvements would provide additional capacity that would be capable of handling the additional demand.

#### **4.13.2 Alternative B**

Alternative B infrastructure construction would be the same as Alternative A. Alternative B would include the addition of an MQ-9 FTU with 42 additional personnel. All public services and utility systems at ISAFAF would have sufficient capacity to accommodate the 42 additional military personnel. The same beneficial, but not significant, consequences would be expected for Alternative B as for Alternative A.

#### **4.13.3 Alternative C**

Infrastructure construction under Alternative C would be substantially less than under Alternative A or Alternative B. Alternative C would not include the upgraded fire protection system, the communication system, or utilities. Alternative C does not include the beneficial consequences associated with Alternative A or Alternative B. Public services and utility systems at ISAFAF would have sufficient capacity to accommodate the reduction in military personnel and the increase in Predator weapons systems. Current training, maintenance, and support activities would continue in compliance with established regulations, plans, and policies.

#### **4.13.4 No-Action Alternative**

Under the No-Action Alternative, existing ISAFAF facilities would not be modified and new Predator facilities would not be constructed. Current training, maintenance, and support activities would continue to be conducted in compliance with established regulations, plans, and policies.

### **4.14 TRANSPORTATION**

Potential transportation impacts can be projected by applying a set of level-of-service (LOS) criteria to the changes in travel demand associated with Alternatives A and B. The relationship between LOS and approach lane volumes for arterial roadways, assuming a 50 percent cycle split, is depicted in Figure 4.14-1.

Lane volumes approaching peak hour volumes of 675 vehicles per hour (VPH) may be characterized as approaching capacity and requiring improvements to traffic flow. For the purpose of this analysis, all Air Force personnel are assumed to use the Main Gate and construction traffic would be confined to the East Gate, which is right turn only to and from U.S. Highway 95.

The short-term traffic impacts of Alternatives A or B assume the same peak hour arrival and departure rates as employees with regular duty hours. Both construction and base-related traffic is typically spread over a longer time period due to shift work and the varying manpower requirements of individual construction projects and sites, so traffic volume estimates are higher than would actually occur.

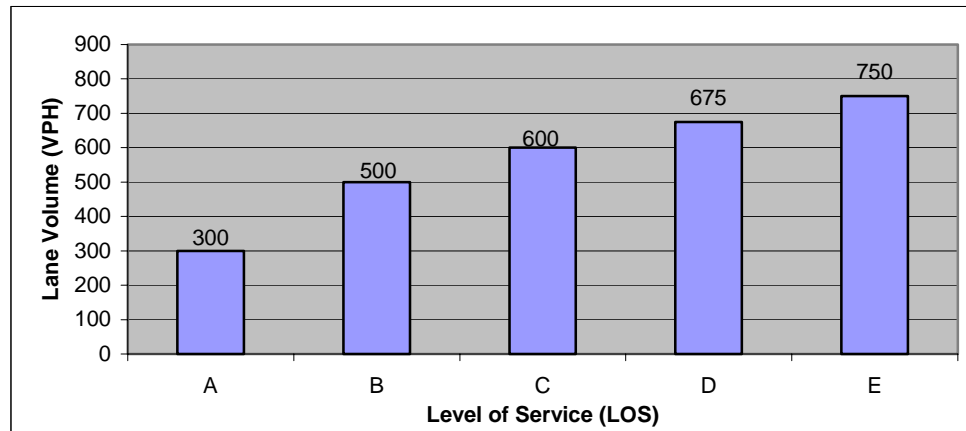


Figure 4.14-1. Lane Volumes and LOS for Arterial Roadways (VPH)

#### 4.14.1 Alternative A

Long-term employment is expected to increase by 101 positions at ISAF AF under Alternative A, bringing total employment to 1,258 jobs and increasing peak hour demand by approximately 8.7 percent. Peak hour volumes are expected to increase from 337 VPH to 374 VPH. As depicted in Figure 4.14-1, this level of demand is consistent with LOS B. Short-term construction employment is expected to increase by a maximum of 890 jobs due to the influx of 540 construction workers in FY06. These workers would use the East Gate, also providing LOS B. This level of service is two levels below the point where traffic volumes would require improvements.

Some improvement to long-term traffic flow would result from an upgraded East Gate. Even after improvement, however, the East Gate would be used only for construction traffic and during times of threat. In terms of traffic flow, the East Gate improvements are beneficial, but not significant.

#### 4.14.2 Alternative B

Long-term employment is expected to increase by 143 jobs at ISAF AF under Alternative B, bringing total ISAF AF employment to 1,300 jobs and increasing peak hour demand by 12.3 percent. Peak hour volumes are expected to increase from 337 VPH to 390 VPH. As depicted in Figure 4.14-1, this level of demand is consistent with LOS B. Short-term employment is expected to increase by a peak of 1,036 jobs due to the influx of 540 construction workers in FY06. These workers would use the East Gate, also providing LOS B. This level of service is two levels below the point where traffic volumes would require improvements. The long-term effects of East Gate improvements would be the same as Alternative A.

#### 4.14.2 Alternative C

Under Alternative C, short-term increases in construction traffic would be expected to be off-set by reductions in personnel assigned to ISAF AF. Long term employment would decrease by approximately 560 jobs at ISAF AF under Alternative C. This reduction in jobs would reduce peak hour traffic demand by over 50 percent. The East Gate would not be improved, but it

would continue to be used for construction traffic and in times of threat. The LOS for Alternative C is not expected to be different from the No Action Alternative.

#### 4.14.3 No-Action Alternative

Under the No-Action Alternative, no increase in employment or traffic volumes would occur. The Main Gate would continue to function at LOS B under similar assumptions to those applied to Alternatives A and B. The East Gate would not be improved.



Improvements to the East Gate, pictured here, would have minor beneficial consequences for transportation under Alternative A or Alternative B.

#### 4.15 HAZARDOUS MATERIALS AND WASTE

This section addresses the proposed siting and ongoing activities associated with proposed action and alternatives relating to hazardous materials use, hazardous waste generation and disposal, and effects on ERP sites. Principal areas of concern addressed in the analysis include (1) direct and indirect impacts associated with use and disposal of hazardous materials and waste, (2) potential impact to known ERP hazardous material sites.

##### 4.15.1 Alternative A

###### *Hazardous and Toxic Materials/Waste Management*

During construction activities associated with Alternative A, contractors and ISAF AF personnel would use hazardous and toxic materials, including primarily paint, adhesives, roofing materials, and other building materials. All hazardous waste disposal would continue to be managed by the DRMO, and in accordance with all state and local laws and all Air Force regulations. The hazardous waste disposal procedures and facilities currently used are adequate for the amount of waste generated by construction activities and would continue to be used.

After completion of construction, ISAFAF personnel would continue to use hazardous and toxic materials in compliance with applicable regulations and Air Force instructions as part of activities associated with the Predator UAV and NTTR support. Materials used would include paints, solvents, thinners, adhesives, aircraft fuel, diesel, gasoline, lubrication oils, batteries, anti-freeze, aerosol cans, and solvent.

The Air Force maintains data within the supply system that are used to generate listings of the hazardous materials that are used for various purposes/processes at the ranges and operations areas. Aircraft maintenance and other ISAFAF maintenance processes such as vehicle maintenance would continue. Existing Air Force pollution prevention processes, known as HAZMART for the management of procurement, handling, storage, and issuing of hazardous materials used on NTTR and ISAFAF, would be adequate for the foreseeable future and would be retained and used. Transportation of hazardous material would continue to be performed in accordance with the Department of Transportation requirements and regulations.

Some hazardous materials are inherent in the design and operation of the Predator aircraft. The MQ-1 multi-spectral targeting system contains beryllium on the surface of the lenses. The MQ-9 hazardous materials inventory lists various greases, lubricants, brake fluid, and fuel. The types of waste currently generated by Predator operations would continue under this alternative, although the amount of waste would likely increase with the beddown of additional Predator UAV assets. However, the hazardous waste disposal procedures and facilities are adequate for the amount of waste generated and would be retained and used. The Air Force would continue to manage the 90-Day Central Accumulation Site for some hazardous waste generators. Waste generation tracking procedures would remain in place. DRMO on Nellis AFB would continue to be responsible for the disposal of excess property and hazardous waste generated on ISAFAF.

##### *ERP Sites*

The Air Force investigates and remediates potential areas of soil and groundwater contamination through the Environmental Restoration Program (ERP). Some new construction would be located on ERP site LF-02. A privately owned vehicle (POV) parking lot is proposed for construction over a portion of the historic landfill. The Air Force has obtained an ERP waiver (see Appendix C) for site LF-02, which will allow the proposed construction. LF-02 is identified as an active ERP site; however, the landfill is not currently used and ERP activities associated with the site involve only long-term monitoring. The construction and use of the POV lot is not likely to affect the ERP monitoring program, and the location of LF-02 would not affect the use of the POV lot. Excavation associated with the construction of the POV lot would not be more than 2 feet and would not affect the site. No habitable structures would be placed on ERP sites.

The program of long-term investigation and remediation by ERP would continue on ISAFAF. Long-term monitoring at two landfills on ISAFAF (ERP Sites LF-01, LF-02) will continue to be accomplished by sampling three monitoring wells at each site annually, and new activities would not affect the monitoring program.

#### **4.15.2 Alternative B**

Activities associated with Alternative B that could potentially affect hazardous materials, waste, and ERP sites would be similar to those associated with Alternative A with a slight increase in the amount generated due to increased Predator use and assets. No significant impacts are anticipated from the production and management of hazardous waste and ERP sites.

#### **4.15.3 Alternative C**

Construction activity associated with Alternative C would use hazardous and toxic materials such as paint, adhesives, building materials, etc. All hazardous materials disposal would be managed DRMO in accordance with state and local laws and Air Force regulations. Alternative C would not include any construction on ERP site LF-02.

#### **4.15.4 No-Action Alternative**

Under the No-Action Alternative, the existing ISAFAF facilities would not be modified and new Predator facilities would not be constructed. No additional hazardous materials or waste would be generated.

This page intentionally left blank.

## 5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

CEQ regulations (40 CFR Section 1508.7) stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions,” commonly referred to as “cumulative effects.” This section provides (1) the definition of cumulative effects; (2) a description of past, present, and reasonably foreseeable actions relevant to cumulative effects; (3) an assessment of the nature of interaction of the proposed action and alternatives with other actions; and (4) an evaluation of cumulative effects potentially resulting from these interactions.

### 5.1 CUMULATIVE EFFECTS

The first step in assessing cumulative effects involves defining the scope of other actions and their interrelationship with the proposed action and alternatives. The cumulative effects analysis evaluates the interaction of multiple actions. Cumulative effects most likely arise when a relationship or synergism exists between a proposed action and alternatives and other actions occurring in close proximity or during a similar time period. Actions geographically overlapping or close to the proposed actions would likely have more potential for a relationship than those farther away. Similarly, actions coinciding in time with the proposed actions would have a higher potential for cumulative effects.

This EA analysis addresses three questions to identify cumulative effects:

- Could affected resource areas of the proposed actions interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If such an interaction exists, does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?
- If such an interaction exists, and there are potentially significant impacts that are not identified when the proposed action is considered alone, what are those impacts?

In this EA, efforts have been made to identify all actions being considered and in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the proposed action in this EA, these actions are included in this cumulative analysis. Actions not occurring within or near the affected area of ISAF AF are not considered in this analysis. This approach enables decisionmakers to have the most current information available so they can evaluate the cumulative environmental consequences of related actions.

#### 5.1.1 Past, Present, and Reasonably Foreseeable Actions

Nellis AFB and ISAF AF are active military installations that undergo continuous changes in mission and in training requirements. To support these requirements, these installations undergo near constant updating and revisions. This process of change is consistent with the United States Defense policy that must be ready to respond to threats to American interests throughout the world. As described in Chapter 2, the proposed beddown that would take place at ISAF AF is isolated from urban centers and is consistent with current ISAF AF and NTTR

activities. This section provides a discussion of the incremental contribution of past, present, and reasonably foreseeable actions.

#### 5.1.1.1 *Past and Present Actions Relevant to the Proposed Action and Alternatives*

Known past and present actions potentially resulting in cumulative effects include Air Force activities at NTTR, multiple airspace uses, changes to ISAFAF, personnel changes at the Nevada Test Site (NTS), modifications to prison facilities at Indian Springs, and modifications to U.S. 95. These actions are described below.

##### *Air Force Activities*

Past and present Air Force actions relevant to the proposed beddown include those described in *Renewal of the Nellis Air Force Range Land Withdrawal Legislative Environmental Impact Statement* (Nellis Renewal LEIS) (USAF 1999). The Nellis Air Force Range (now named Nevada Test and Training Range [NTTR]) land withdrawal was reviewed by Congress in 2000. Congress reauthorized the withdrawal and reservation, consisting of approximately 3.0 million acres, for use as an armament and high-hazard test area; training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; and other defense-related purposes. The Bureau of Land Management manages environmental resources on approximately 2.2 million acres of the NTTR pursuant to the Federal Land Policy and Management Act of 1976 and other applicable laws. Environmental resources on the remaining 826,000 acres of the NTTR are within the Desert National Wildlife Range and are managed by the U.S. Fish and Wildlife Service.

In 1995, the Air Force beddown an initial 20 Predator UAVs at ISAFAF. In 1996, another 25 were beddown, bringing total Predator UAVs operating out of ISAFAF in 1997 to 45 (USAF 1996). Facilities required for operation and maintenance of the UAVs and an Imagery Unit were constructed. The overall mission of Nellis AFB and the Reconnaissance Squadrons at ISAFAF remained the same.

Since 1995, existing buildings at ISAFAF have been modified to provide for hangar, maintenance, academic, runway, and utilities support facilities to support ongoing NTTR missions. Additionally, warehouses, academic facilities, and parking lots have been constructed at ISAFAF. Dorm facilities, an additional academic building, and an ordinance loading area and support facility are planned to be constructed to further support these missions. These building modifications and new construction are within the existing cantonment area.

##### *Airspace Uses*

Past and present airspace actions relevant to the proposed beddown include those described in *Renewal of the Nellis Air Force Range Land Withdrawal Legislative Environmental Impact Statement* (Nellis Renewal LEIS) (USAF 1999).

##### *Personnel Changes at Nevada Test Site*

The Department of Energy operates NTS, which is located 65 miles northwest of the City of Las Vegas, approximately 30 miles northwest of ISAFAF. The Test Site encompasses 1,350 square miles of desert and mountainous terrain and is surrounded on three sides by NTTR. The NTS

disposes of low-level radioactive waste onsite from the Site and from other Department installations. In addition, the Site stores mixed transuranic waste from Lawrence Livermore National Laboratory pending shipment to the Waste Isolation Pilot Plant. Pure transuranic waste may also be accepted for storage on a case-by-case basis. Between 1987 and 1998, NTS employment reduced from 11,500 to 3,390 persons. Additional reductions of 145 employees have been proposed. (*Las Vegas Review-Journal*, 2002).

#### *Modification of Prison Facilities*

The Southern Desert Correctional Center, Indian Springs Conservation Camp, Indian Springs Boot Camp, and High Desert State Prison are located on Cold Creek Road in Indian Springs, Nevada. The Southern Desert Correctional Center was opened in the early 1980s and has been remodeled to respond to changing needs. In the 1980s, a seventh housing unit was built outside of the original perimeter and an eighth high security, 200-cell housing unit was constructed near the center of the institution. The Southern Desert Correctional Center has a staff of 246 and is designed for a capacity of 914 persons. It has an operating capacity of 1,354 and an emergency capacity of 1,458.

The Indian Springs Conservation Camp and Indian Springs Boot Camp are minimum-security facilities housing 228 inmates: 168 in the conservation camp and 60 in the boot camp. The Indian Springs Conservation Camp and Boot Camp have a staff of 23 and are designed for a capacity of 228 persons. Operating capacity is 228 and emergency capacity is 228.

The High Desert State Prison is the largest major institution in the Nevada Department of Corrections and is designed for a capacity of 1,832 persons. Operating capacity is 1,816 and emergency capacity is 1,890. The institution opened September 1, 2000. The complex totals approximately 1,576,000 square feet of space.

#### *Modification of U.S. Highway 95*

Interstate 215 (I-215) and Clark County 215 compose the Las Vegas Beltway running from Interstate 515 in the southeast in a clockwise direction to Interstate 15 (I-15) in the south, the Summerlin Parkway in the west, U.S. 95 in the northwest, and I-15 again in the north. The Nevada Department of Transportation is proposing to extend I-215 northwest of Nellis AFB, to run as an extension from I-15 to U.S. 95 (*Las Vegas Review-Journal* 2001).

##### **5.1.1.2 Reasonably Foreseeable Actions that Interact with the Proposed Action**

This category includes foreseeable or proposed Air Force actions that have a potential to coincide, either partially in time or geographic extent, with the proposed action. These actions are described below or have been analyzed previously in the Nellis Renewal LEIS (USAF 1999).

Other currently proposed facilities at ISAFAF include the proposed Expeditionary Readiness Training (ExpeRT) program, which will put ACC security forces teams in a Nevada desert environment to prepare them for Aerospace Expeditionary Force deployments and contingencies. In addition, facilities in support of the Hellfire missile system are proposed for ISAFAF. The proposed Predator project facilities and other currently proposed project facilities at ISAFAF are shown on Figure 5-1.

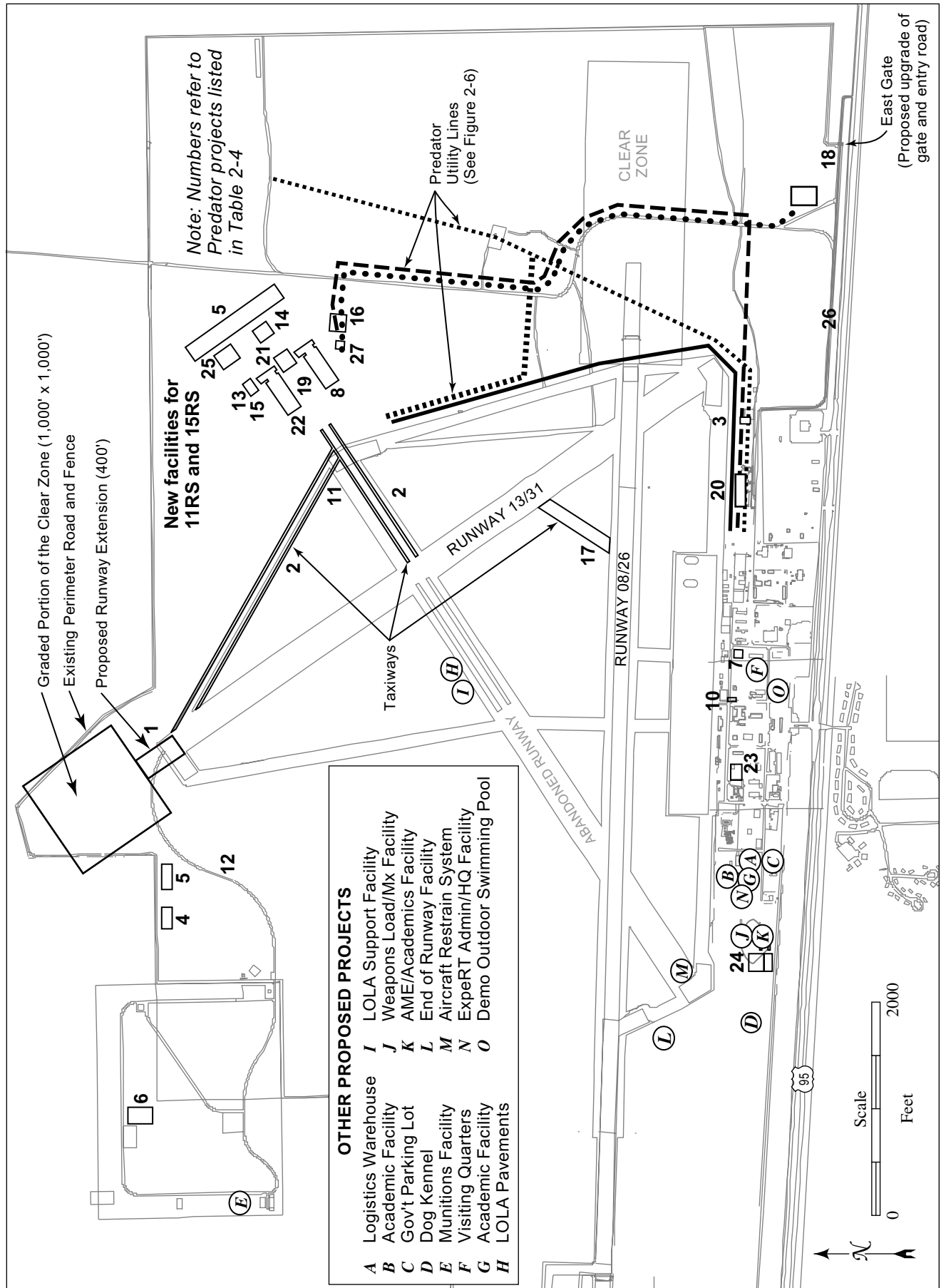


Figure 5-1. Predator and Other Project Facilities Currently Proposed at ISAFAF

In 2002 the Air Force proposed the Nevada Training Initiative (NTI), which called for construction of a High-technology Test and Training Complex (HTTC) and a Military Operations in Urban Terrain (MOUT) training area and associated facilities and infrastructure at NTTR and ISAFAF (USAF 2002c). Proposed NTI activities at or near ISAFAF include (1) construction of the facilities associated with the MOUT (i.e., academic, lodging, dining, and kennel facilities) at ISAFAF and (2) construction of these associated facilities on Air Force lands across U.S. 95 from ISAFAF. Construction of ground training facilities and infrastructure are projected to extend through 2007.

Aviation activities and airspace uses on NTTR and R-2508 will continue to vary, depending upon mission priorities. Airspace managers at both NTTR and Edwards AFB manage these activities. Additionally, commercial and general aviation activities within the Las Vegas region are projected to continue to increase in the foreseeable future.

Construction activities will continue to occur at Nellis AFB and ISAFAF, as they are active military installations, frequently undergoing changes in mission and in training requirements.

### **5.1.2 Analysis of Cumulative Impacts**

No specific projects have been identified under Alternatives A, B, or C that would produce incremental impacts when added to other past, present, or reasonably feasible future actions at ISAFAF or Nellis AFB. Nellis AFB and ISAFAF are active military resources that undergo changes in mission and in training requirements in response to defense policies, current threats, and tactical and technological advances. The auxiliary airfield, the base and the range, like any other major institution (e.g., university, industrial complex), require new training components, construction, facility improvements, infrastructure upgrades, and maintenance and repairs. All of these factors (i.e., mission changes, training updates, and facility improvements) would continue to occur before, during, and after the proposed action if it is selected.

#### **5.1.2.1 Air Force Activities**

Past and present Air Force activities at NTTR are described in the Nellis Renewal LEIS (USAF 1999). When the impacts of the present action are viewed cumulatively with the impacts described in the Nellis Renewal LEIS, no additional significant impacts are anticipated separate from those described in the Nellis Renewal LEIS. The addition of approximately 50 Predator UAVs to the 40 currently operating out of ISAFAF are not anticipated to have impacts beyond those described in Chapter 4.0.

Other activities include typical construction and maintenance activities at ISAFAF in support of current and future Air Force missions and those proposed in the March 2002 Nevada Training Initiative (NTI). Environmental consequences from NTI and typical construction activities affecting ISAFAF or Air Force lands across U.S. 95 include: increased, but minimal and temporary contributions to regional air emissions primarily from initial construction of associated training facilities; minimal disturbance to soils and vegetation on previously disturbed Air Force lands from construction involving grading, stabilization, filling, creation of culverts to channel storm water runoff, watering construction sites to limit fugitive dust, or the creation of road crossings to; and short-term construction noise. These actions when cumulatively considered with the proposed actions, would not significantly affect the resource

areas of the proposed actions and are minimal when compared to the construction activities occurring in the Las Vegas area from residential growth and development.

#### **5.1.2.2    *Airspace Uses***

Changes in sortie numbers would be scheduled with airspace managers and integrated into flight schedules according to mission priorities. These changes in airspace activities are not expected to significantly affect NTTR or R-2508 airspace use.

Any expansion of the Las Vegas International Airport or the establishment of a new airport between Jean and Primm, Nevada would require FAA review to determine the potential cumulative impacts such growth may have on the compatible use of airspace by all military and civil aviation interests.

#### **5.1.2.3    *Personnel Changes at Nevada Test Site***

Reduction in personnel at the Department of Energy's Nevada Test Site (NTS) has reduced the number of NTS employees commuting on U.S. 95. The changes in personnel at ISAFAP would have no discernible effect on traffic.

#### **5.1.2.4    *Modification of Prison Facilities***

Environmental consequences from prison facilities located near the community of Indian Springs do not geographically overlap with environmental consequences from proposed Air Force facilities. No cumulative effects would result from prison facility modifications and the proposed action.

#### **5.1.2.5    *Modification of U.S. Highway 95***

The environmental impacts of the construction of the I-215 connector between I-15 and U.S. 95 would not geographically overlap with the environmental consequences from the proposed actions at ISAFAP.

## **5.2        *IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES***

NEPA CEQ regulations require environmental analysis to identify "...any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented" (40 CFR Section 1502.16). CEQ guidelines describe primary irreversible and irretrievable resource commitments as uses of nonrenewable resources throughout a project that may be irreversible if removal or destruction of the resources occurs and cannot be replaced within a reasonable time frame (e.g., extinction of a threatened or endangered species, energy or mineral depletion) or if obstruction of the use of resources occurs after the project (e.g., a building over a cultural site).

Secondary impacts can result from environmental accidents or developments associated with a project such as explosive fires or highway improvements that provide access to previously inaccessible areas (CEQ Guidelines 15126(e)).

For Alternatives A, B, or C any potential environmental consequences would be short-term and temporary, or longer lasting, but negligible. Training operations would continue and involve consumption of nonrenewable resources, such as fuel used in vehicles and in aircraft. Use of

ordnance would involve commitment of resources and other chemicals. None of these activities would be expected to significantly decrease the availability of minerals or petroleum resources. Personal vehicle use by the personnel continuing to support the existing missions would consume water, fuel, oil, and lubricants. The proposed action would increase their use, but would not significantly affect the availability of the resources.

Construction would occur on previously disturbed areas and on some undisturbed lands. Minimal impacts would result on vegetation; however, the impacts are not irreversible or irretrievable. While construction of new facilities would incur soil disturbance and loss, use of geotechnical recommendations, common construction practices (e.g., watering roads while undertaking construction, building culverts to channel stormwater), and grading in accordance with Uniform Building Code requirements would localize and minimize soil loss. No additional impacts on cultural or archeological resources would result.



**Continued use of common construction practices, as pictured here at ISAF AF would result in no significant irreversible or irretrievable commitment of resources.**

This page intentionally left blank.

## 6.0 REFERENCES CITED

- ACC (Air Combat Command). 2003. Predator MQ-1/MQ-9 SATAF Outbrief. Unclassified Briefing. Maj. Harry Washington, Basing Branch. 13 February.
- AFSC (U.S. Air Force Safety Center). 2003. RQ-1 and F-16 Class A Mishap History. <http://safety.kirtland.af.mil/AFSC/RDBMS/Flight/stats/>
- \_\_\_\_\_. 2002. Bird-Aircraft Strike Hazard Team. Selected Statistics. [http://safety.kirtland.af.mil/AFSC/Bash/stats/web\\_pof\\_stat.html](http://safety.kirtland.af.mil/AFSC/Bash/stats/web_pof_stat.html)
- Atwood, N.D., F.J. Smith, and T.A. Knight. "Two New Species of *Phacelia* (Hydrophyllaceae) from the Southwestern United States." *Novon* 12:1. pp. 19-26.
- BLM (Bureau of Land Management). 1992. Nellis Air Force Range Resource Plan and Record of Decision.
- Clark County. 2000. Final Multiple Species Habitat Conservation Plan and Environmental Impact Statement for Issuance of a Permit to Allow Incidental Take of 79 Species in Clark County, Nevada. September 2000. Available at [http://www.co.clark.nv.us/comprehensive\\_planning/environmental/MultipleSpecies/MultipleSpeciesHabitatConservationPlan.htm](http://www.co.clark.nv.us/comprehensive_planning/environmental/MultipleSpecies/MultipleSpeciesHabitatConservationPlan.htm)
- Dames & Moore, Inc. 1997a. Nellis Air Force Base and Range Bat Survey Report. Nellis Air Force Base, Nevada, Environmental Management Directorate, Natural Resources. April.
- \_\_\_\_\_. 1997b. Nellis Air Force Base and Range Bird Survey Report. Nellis Air Force Base, Nevada. January-October.
- \_\_\_\_\_. 1996a. Biological Resources Technical Memorandum – Environmental Assessment Regional Training Area Indian Springs Air Force Auxiliary Field – Nellis Air Force Base, Nevada. May.
- \_\_\_\_\_. 1996b. Archaeological Survey of the Indian Springs Air Force Auxiliary Field. Prepared for the U.S. Department of the Air Force. March.
- DoD (Department of Defense). 2002. UAV Roadmap 2002. Draft Version 7. UAV Planning Task Force. November.
- \_\_\_\_\_. 1995. An Inventory for Rare, Threatened, Endangered, and Endemic Plants and Unique Communities on Nellis Air Force Bombing and Gunnery Range, Clark, Lincoln, and Nye Counties, Nevada. Prepared in cooperation with The Nature Conservancy and Nellis Air Force Base.
- \_\_\_\_\_. 1993. Military Standard System Safety Program Requirements (MIL-STD-882). Washington, DC. January.
- Environmental Solutions, Inc. 1995. Archaeology of Areas II and III, NAFB, Clark County, Nevada. August.

- Holzworth, G.C.. 1964. Estimates of Mean Maximum Mixing Depth in the Contiguous United States. *Monthly Weather Review* 92(5): 235-242.
- Hunt, Charles B. 1974. *Natural Regions of the United States and Canada*.
- ICBO (International Conference of Building Officials). 1991. *Uniform Building Code*. Whittier, California.
- Jagielski, K. and J. O'Brien. 1994. Calculation Methods for Criteria Air Pollution Emission Inventories. USAF, Armstrong Laboratory, AL/OE-TR-1994-0049. Brooks AFB.
- Las Vegas Review-Journal. 2001. "LAS VEGAS BELTWAY: Road may expand east." July 13.
- Lee, Robert A. and Mohlman, H.T. 1990. Air Force Procedure for Predicting Aircraft Noise Around Airbases: Airbase Operations Program (BASEOPS) Description. Harry G. Armstrong Aerospace Medical Research Laboratory, Human Systems Division, Air Force Systems Command, Wright-Patterson AFB, OH. AAMRL-TR-90-012. January.
- Lucas, M.J. and P.T. Calamia. 1996. Military Operating Area and Range Noise Model MR\_NMAP Users Manual. Occupational and Environmental Health Directorate, Bioenvironmental Engineering Division, Noise Effects Branch, Wright Patterson AFB, OH. AL/OE-MN-1996-0001. June.
- Mariah and Associates, Inc. 1994. Systematic Study of Air Combat Command Cold War Material Culture. MAI Project 735-15. November.
- Moulton, Carey L. 1990. Air Force Procedure for Predicting Aircraft Noise Around Airbases: Noise Exposure Model (NOISEMAP) User's Manual. Harry G. Armstrong Aerospace Medical Research Laboratory, Human Systems Division, Air Force Systems Command, Wright-Patterson AFB, OH. AAMRL-TR-90-011. February.
- Mozingo, H.N. and M. Williams. Threatened and Endangered Plants of Nevada, An Illustrated Manual. 1980. Funded by U.S. Fish and Wildlife Service, Bureau of Land Management. May.
- Myhrer, K. 1996. Opportunistic Hunting Patterns among Late Archaic Aborigines in the Vicinity of Indian Springs, Nevada. Department of Defense. May.
- Nellis AFB. 1998. Cultural Resources Management Plan. 31 August.
- Nellis AFB Environmental Management. 2003a. Indian Springs Air Force Auxiliary Field – 2002 Air Emissions Inventory.
- \_\_\_\_\_. 2003b. Nellis Air Force Base – 2002 Air Emissions Inventory.
- Nevada Natural Heritage Program. 2001. Nevada Rare Plant Atlas. J.D. Morefield (ed.). Prepared for the U.S. Department of the Interior, Fish and Wildlife Service. June.
- Page & Turnbull, Inc. 1988. An Inventory and Evaluation of World War II Structures at Nellis Air Force Base and Indian Springs Auxiliary Air Force Field, Nevada. September.

- Rowe, S. 2000. A Class III Inventory in Areas II and III. Nellis AFB Cultural Resources Report 00-04. November.
- Rowe, S. and K. Myhrer. 2001. Reevaluation of Archaeology Sites on Nellis Air Force Base. Nellis AFB Cultural Resources Report 01-01. January.
- SCAQMD (South Coast Air Quality Management District). 1993. California Environmental Quality Act (CEQA) Air Quality Handbook.
- Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston.
- USACE (U.S. Army Corps of Engineers and Merrick & Company). 2003. Amendment to Charrette Report - Squad Ops/AMU/Hangar. Indian Springs AFAF, Indian Springs, Nevada. March.
- USAF (U.S. Air Force). 2003. General Plan for Nellis Air Force Base, Nevada. Includes General Plan Summary for Indian Springs Air Force Auxiliary Field, Nevada.
- \_\_\_\_\_. 2002a. Drinking Water Quality Report for Indian Spring Air Force Auxiliary Field.
- \_\_\_\_\_. 2002b. Nellis AFB Facilities Site Survey.
- \_\_\_\_\_. 2002c. Draft Nevada Training Initiative Environmental Assessment. March.
- \_\_\_\_\_. 2001a. Air Force Instruction (AFI) 91-204 -- Safety. Safety Investigations and Reports. 11 December.
- \_\_\_\_\_. 2001b. Management Action Plan, Nellis AFB, Nevada (ACC). Air Force Project No. ACCH20017544. December.
- \_\_\_\_\_. 2001c. HQ ACC Infrastructure Assessment for Indian Springs Air Force Auxiliary Field.
- \_\_\_\_\_. 1999. Renewal of the Nellis Air Force Range Land Withdrawal Final Legislative Environmental Impact Statement.
- \_\_\_\_\_. 1998. Final Water Requirements Study. September.
- \_\_\_\_\_. 1997. Integrated Natural Resources Management Plan, Nellis Air Force Base, Nellis Air Force Range.
- \_\_\_\_\_. 1996. Environmental Assessment for the Proposed Increased Beddown of the Predator Unmanned Aerial Vehicle (UAV) at Indian Springs Air Force Auxiliary Field.
- U.S. Air Force Civil Engineer Support Agency. 2001. United Facilities Criteria (UFC) 3-260-01 -- Airfield and Heliport Planning and Design. U. S. Army Corps of Engineers, Naval Facilities Engineering Command. 1 November.
- U.S. Bureau of the Census. 2000. Census 2000.

- USDOL (U. S. Department of Labor). 2001. National Census of Fatal Occupational Industries in 2000. Bureau of Labor Statistics. August. <http://stats.bis.gov/oshhome.htm>
- USEPA (U.S. Environmental Protection Agency). 2003. National Priorities List. Description and site list. <http://www.epa.gov/superfund/sites/npl/index.htm>
- \_\_\_\_\_. 2002. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I, Stationary Point and Area Sources. Office of Air Quality Planning and Standards (OAQPS). <http://www.epa.gov/ttn/chief/ap-42/index.html>
- \_\_\_\_\_. 1992. Procedures for Emission Inventory Preparation -- Volume IV: Mobile Sources. EPA-450/4-81-026d.
- USFWS (U.S. Fish and Wildlife Service). 2003. "Avoid Construction Delays – Help Protect Burrowing Owls in Clark County." In Protecting the Biological Diversity of the Great Basin & Mojave Desert. Nevada Office of the USFWS. <http://nevadafwo.fws.gov/UrbanWildlife/burrowingowl.pdf>
- \_\_\_\_\_. 1992. Field Survey Protocol for Any Federal Action that May Occur Within the Range of the Desert Tortoise.
- USGS (U.S. Geological Survey). 2001. Online Table of Seismic Hazards. <http://geohazards.cr.usgs.gov/eq/faults/fsrpage11.html>

## **7.0 PERSONS AND AGENCIES CONTACTED**

Anderson, Spenser. Deputy Commander. 98<sup>th</sup> Operations Group Detachment 2, ISAF AF. March 2003.

Austin, John K. Aircraft Noise Specialist. Air Combat Command, Langley AFB. March 2003.

Callahan, James. Airspace Manager. 57<sup>th</sup> Operations Support Squadron, Nellis AFB. March 2003.

George, James. Assistant Fire Chief. 98<sup>th</sup> Support Squadron, ISAF AF. January 2003.

Myhrer, Keith. Base Archaeologist. 99<sup>th</sup> Civil Engineering Squadron, Nellis AFB. March 2003.

Quinn, Patrick. Environmental Engineer. 99<sup>th</sup> Civil Engineering Squadron, Nellis AFB. January 2003.

Roe, John. Environmental Engineer. 99<sup>th</sup> Civil Engineering Squadron, Nellis AFB. January-March 2003.

Webb, Denise. Community Planner. 99<sup>th</sup> Civil Engineering Squadron, Nellis AFB. January-April 2003.

This page intentionally left blank.

## 8.0 LIST OF PREPARERS

Jessica Benson, Land Use/Infrastructure/Environmental Justice, SAIC

B.A., Environmental Studies, University of California at Santa Barbara, 2002

Years of Experience: 1

Gary E. Bertolin, Air Quality, SAIC

B.S., Chemistry, California State University at Fresno, 1968

M.S., Atmospheric Science, Colorado State University, 1970

Ph.D., Meteorology and Air Quality, State University of New York, 1978

Years of Experience: 27

James P. Campe, 99ABW/EMN, Nellis AFB

B.S. Naval Architecture and Offshore Engineering, University of California, Berkeley, 1986

Certificate in Hazardous Materials Management, University of California, Davis

Certificate in Environmental Auditing, University of California, Davis

Certificate in Site Investigation and Remediation, University of California, Davis

Years of Experience: 17

Christopher Clayton, Project Manager/Socioeconomics, SAIC

B.A., Honours, Oxford University, 1966

M.A., University of Cincinnati, 1968

Ph.D., Clark University, 1971

Years of Experience: 31

Michael L. Dungan, Biological Resources, SAIC

B.A., Zoology, University of California, Santa Barbara, 1975

M.S., Ecology/Evolutionary Biology, University of Arizona, 1979

Ph.D., Ecology/Evolutionary Biology, University of Arizona, 1984

Years of Experience: 26

Cay FitzGerald, Graphics, SAIC

Studies toward B.A., Fine Arts, Santa Barbara City College

Years of Experience: 20

Karen R. Foster, Cultural Resources, SAIC

B.A., Anthropology, University of California at Irvine 1989

M.A., Anthropology, University of California at Santa Barbara 1993

Ph.D., Anthropology, University of California at Santa Barbara 1998

Years of Experience: 12

Deborah Hiller, Cumulative Effects/Public Affairs, SAIC

B.S., Chemistry, University of Idaho, 1992

J.D., Law, University of Utah, 1996

Years of Experience: 8

Richard A. Kentro, Deputy Project Manager/Visual Resources, SAIC

B.S., Social Sciences, Michigan State University, East Lansing, 1968

B.A., Environmental Studies, University of California at Santa Barbara, 1974

M.A., Environmental Planning, University of California at Los Angeles, 1977

Years of Experience: 27

Maria R. Jaminet, Air Quality, SAIC

B.S. and M.S., Biology and Chemical Biology, Swiss Federal Institute of Technology at Zurich, Switzerland, 1991

M.S., Environmental Engineering, Swiss Federal Institute of Technology at Lausanne, Switzerland, 1993

Years of Experience: 8

Bradley S. Norling, Biology, SAIC

B.S., Wildlife Biology, University of Montana, Missoula, Montana, 1987

M.S., Zoology and Physiology, University of Wyoming, Laramie, Wyoming, 1991

Years of Experience: 12

Sheryl K. Parker, Air Force Project Manager, HQ ACC/CEVP

B.S., Agronomy, Virginia Polytechnic Institute and State University, 1980

Years of Experience: 18

Trevor Pattison, Geology and Soils/Water Resources/Hazardous Materials, SAIC

B.S., Geological Sciences-Earth Systems, University of California at Santa Barbara, 1999

Years of Experience: 4

Perry W. Russell, Geology and Soils/Water Resources/Hazardous Materials, SAIC

B.A., Geological Sciences, University of California at Santa Barbara, 1984

M.S., Geological Sciences, California State University, Northridge, 1988

Cal OSHA 40-hour training: Hazardous Materials

Years of Experience: 15

Jeff M. Reece, Socioeconomics, SAIC

S.B., Chemical Engineering, Massachusetts Institute of Technology, 1968

M.S., Civil Engineering, University of California at Berkeley, 1974

Years of Experience: 29

Forrest C. Smith, Editor, SAIC

B.A., History and Political Science, University of California at Santa Barbara, 1970

Years of Experience: 30

Edward D. Studholme, Noise, Transportation, SAIC

B.A., Sociology, George Washington University, D.C., 1967

Master of Urban and Regional Planning, George Washington University, D.C., 1972

Years of Experience: 30

Robert E. Van Tassel, Program Manager, SAIC

B.A., Economics, University of California at Santa Barbara, 1970

M.A., Economics, University of California at Santa Barbara, 1972

Years of Experience: 30

William A. Wuest, Airspace Management/Safety, SAIC

B.S., Political Science, St. Joseph's College, 1963

M.P.A., Public Administration, Auburn University, 1974

Years of Experience: 38

## **Appendix A**

---

### **Agency Coordination**

- A-1. U.S. Fish and Wildlife Service Correspondence**
- A-2. Interagency and Intergovernmental Coordination  
for Environmental Planning (IICEP) Mailing List**
  - A-3. Sample IICEP Letters**
  - A-4. Agency Scoping Letters**



**A-1. U.S. Fish and Wildlife Service Correspondence**





United States Department of the Interior

RECEIVED

FISH AND WILDLIFE SERVICE  
NEVADA FISH AND WILDLIFE OFFICE  
1340 FINANCIAL BOULEVARD, SUITE 234  
RENO, NEVADA 89502

MAR 5 2003

MAIL ROOM BARBARA

March 17, 2003  
File No. 1-5-03-SP-491

Mr. Alton Chavis  
Chief, Environmental Analysis Branch  
Attn: Ms. Sheryl Parker  
HQ ACC/CEVP  
129 Andrews Street, Suite 102  
Langley Air Force Base, Virginia 23665-2969

Dear Mr. Chavis:

Subject: Species List for the Proposed Force Structure Changes at Indian Springs  
Air Force Auxiliary Field, Indian Springs, Nevada

This responds to your letter dated February 18, 2003, and received in our office February 27, 2003, requesting information on threatened and endangered species and species of concern that *may* occur in the vicinity of the proposed force structure changes at Indian Springs Air Force Auxiliary Field, Indian Springs, Nevada. We have enclosed a list of threatened and endangered species that *may* be present within the vicinity of, or be affected by, the proposed land sale (Enclosure A). This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency. Please reference the species list file number shown above in all subsequent correspondence concerning this project.

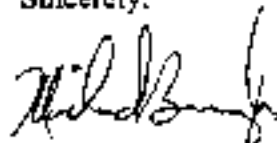
Enclosure A also lists the species of concern to the Nevada Fish and Wildlife Office that may occur in the project area. The Service has used information from State and Federal agencies and private sources to assess the conservation needs and status of these species. Further biological research and field study are needed to resolve the conservation status of these taxa. One potential benefit of considering these species during project planning, is that by exploring alternatives early in the planning process, it may be possible to provide long-term conservation benefits for these species and avoid future conflicts that could otherwise develop. We also recommend that you contact the Nevada Natural Heritage Program (1550 East College Parkway, Suite 137, Carson City, Nevada 89710, 775-687-4245) and the appropriate regional office of the Nevada Division of Wildlife, as well as other local, State, and Federal agencies for distribution data and information on conservation needs on these and other species of concern that may occur in your project area. Potential impacts to species of concern should be considered during the environmental documentation process.

Enclosure B provides a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative. If the proposed project is authorized, funded, or carried out by a Federal agency, and if it is determined that a listed species may be affected by the proposed project, the Federal agency should initiate consultation pursuant to 50 CFR § 402.14. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office. If, through informal consultation or development of a biological assessment, or both, you determine that the proposed action is not likely to adversely affect the listed species, and the Service concurs in writing, then the consultation process is terminated and formal consultation is not required.

We recommend that activities resulting in surface disturbance or the removal of vegetation be timed to avoid potential destruction of active bird nests or young of birds that breed in the area. Such destruction may be in violation of the Migratory Bird Treaty Act (MBTA) (15 U.S.C. 701-718h). Under the MBTA, active nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If active nests are located, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Should you have further questions, please contact Dan Reinkensmeyer of the Southern Nevada Field Office, at 702-515-5230.

Sincerely,



*RS* Robert D. Williams  
Field Supervisor

Enclosures

cc:

Science Applications International Corp, Santa Barbara, California

## ENCLOSURE A

### LISTED SPECIES AND SPECIES OF CONCERN THAT MAY OCCUR WITHIN THE VICINITY OF THE PROPOSED FORCE STRUCTURE CHANGES AT INDIAN SPRINGS AIR FORCE AUXILIARY FIELD, INDIAN SPRINGS, NEVADA

File Number: 1-5-03-SP-491

March 17, 2003

#### Listed Species

##### Reptile

Desert tortoise (T)

*Gopherus agassizii*

---

T = Threatened

#### Species of Concern

##### Mammals

Townsend's big-eared bat  
Spotted bat  
Greater western mastiff bat  
Allen's big-eared bat  
California leaf-nosed bat  
Small-footed myotis  
Long-eared myotis  
Fringed myotis  
Cave myotis  
Long-legged myotis  
Yuma myotis  
Big freetail bat

*Corynorhinus townsendii*  
*Euderma maculatum*  
*Eumops perotis californicus*  
*Idionycteris phyllotis*  
*Macrotus californicus*  
*Myotis ciliolabrum*  
*Myotis evotis*  
*Myotis thysanodes*  
*Myotis velifer*  
*Myotis volans*  
*Myotis yumanensis*  
*Nyctinomops macrotis*

##### Birds

Western burrowing owl  
Gray flycatcher  
Phainopepla  
Lucy's warbler

*Athene cunicularia hypugae*  
*Empidonax wrightii*  
*Phainopepla nitens*  
*Vermivora luciae*

##### Reptiles

Banded Gila monster  
Chuckwalla

*Heloderma suspectum cinctum*  
*Sauromalus ater*

##### Plants

White bearpoppy  
Nye milkvetch  
Clokey buckwheat  
Delicate rockdaisy  
Clark phacelia

*Arctomecon merriamii*  
*Astragalus nyensis*  
*Eriogonum keermunnii* var. *clokeyi*  
*Perityle intricata*  
*Phacelia filae*

## ENCLOSURE B

### FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7 (a) and (c) OF THE ENDANGERED SPECIES ACT

#### SECTION 7 (a); Consultation/Conference

Requires:

- 1) Federal agencies to utilize their authorities to carry out programs to conserve **endangered and threatened species**;
- 2) Consultation with the Fish and Wildlife Service (Service) when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species or critical habitat;
- 3) Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

#### SECTION 7 (c); Biological Assessment - Major Construction Activity <sup>4</sup>

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action on listed and proposed species. The process begins with a Federal agency requesting from the Service a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with the Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA:

1. An onsite inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present.

2. A review of literature and scientific data to determine species distribution, habitat needs, and other biological requirements.
3. Interviews with experts, including those within the Service, State conservation departments, universities, and others who may have data not yet published in scientific literature.
4. An analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat.
5. An analysis of alternative actions considered.
6. Documentation of study results, including a discussion of study methods used, any problems encountered, and other relevant information.
7. Conclusion as to whether or not a listed or proposed species will be affected.

Upon completion, the BA should be forwarded to our office with a request for consultation, if required.

- 
4. A construction project (or other major undertaking having similar physical impacts) is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332 (2) C).



**A-2. Interagency and Intergovernmental Coordination  
for Environmental Planning (IICEP) Mailing List**



## **APPENDIX A-2 IICEP MAILING LIST**

U.S. Fish and Wildlife Service, Nevada Ecological Field Office, Field Supervisor, Reno, Nevada  
U.S. Fish and Wildlife Service, Desert National Wildlife Refuge Complex, Las Vegas, Nevada  
U.S. Department of Energy, Nevada Operations Office, Las Vegas, Nevada  
BLM Nevada State Office, Reno, Nevada  
BLM Las Vegas Field Office, Field Office Manager, Las Vegas, Nevada  
Federal Aviation Administration, Las Vegas, Nevada  
Humboldt/Toiyabe National Forrest, Natural Resources Officer, Sparks, Nevada  
Congressman Jim Gibbons, U.S. House of Representatives  
Congressman Jon Porter, U.S. House of Representatives  
Senator Harry Reid, U.S. Senate  
Senator John Ensign, U.S. Senate  
Governor Kenny Guinn, State of Nevada  
Assemblyman Chad Christensen, Nevada State Assembly  
Assemblyman Kelvin Atkinson, Nevada State Assembly  
Senator Mike McGinness, Nevada State Senate  
Nevada Division of Wildlife, Las Vegas, Nevada  
Nevada Natural Heritage Program, Carson City, Nevada  
Nevada State Clearinghouse, Carson City, Nevada  
Nevada State Historic Preservation Office, Carson City, Nevada  
Clark County Board of Commissioners, Chairman Rory Reid  
Lincoln County Board of Commissioners, Chairman Spencer Hafen  
Nye County Board of Commissioners, Chairman Henry Neth  
City of Las Vegas, Mayor Oscar Goodman  
Las Vegas Chamber of Commerce, Las Vegas, Nevada  
Las Vegas Library, Las Vegas, Nevada  
City of North Las Vegas, Mayor Michael Montandon  
North Las Vegas Chamber of Commerce, North Las Vegas, Nevada  
North Las Vegas Library, North Las Vegas, Nevada  
Beatty Chamber of Commerce, Beatty, Nevada  
Indian Springs Community Center, Indian Springs, Nevada

Indian Springs Library, Indian Springs, Nevada  
Benton Paiute Indian Tribe, Chairperson, The Honorable Rose Marie Saulque  
Big Pine Paiute Tribe, Owens Valley, Chairperson, The Honorable Jessica Bacoch  
Bishop Paiute Indian Tribe, Chairperson, The Honorable Monty Bengochia  
Bishop Paiute Indian Tribe, Tribal Representative, Ms. Gaylene Moose  
Chemehuevi Indian Tribe, Chairperson, The Honorable Edward Smith  
Colorado River Indian Tribes, Chairperson, The Honorable Daniel Eddy, Jr.  
Duckwater Shoshone Tribe, Chairperson, The Honorable Rodney Mike  
Ely Shoshone Tribe, Chairperson, The Honorable Alfred Stanton  
Ely Shoshone Tribe, Chairperson, Victor McQueen, Sr.  
Fort Independence Indian Tribe, Chairperson  
Fort Mojave Tribe, Tribal Chairperson, The Honorable Nora Helton  
Fort Mojave Tribe, Tribal Representative, Mr. Felton Bricker  
Kaibab Band of Southern Paiutes, Chairperson, The Honorable Carmen Bradley  
Kaibab Band of Southern Paiutes, Tribal Representative, Ms. Vivienne Caron-Jake  
Las Vegas Indian Center, Chairperson, Board of Directors, The Honorable Jesse Leeds  
Las Vegas Paiute Tribe, Chairperson, The Honorable Gloria Hernandez  
Lone Pine Paiute-Shoshone Tribe, Chairperson, The Honorable Rachel Joseph  
Moapa Band of Paiutes, Chairperson, The Honorable Philbert Swain  
Pahrump Paiute Tribe, Chairperson, The Honorable Richard Arnold  
Paiute Indian Tribes of Utah, Chairperson, The Honorable Lora Tom  
Timbisha Shoshone Tribe, Chairperson, The Honorable Leroy Jackson  
Yomba Shoshone Tribe, Chairperson, The Honorable James Birchim  
Yomba Shoshone Tribe, Tribal Representative, Mr. Maurice Frank-Churchill

### **A-3. Sample IICEP Letters**





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

18 FEB 2003

HQ ACC/CEVP  
129 Andrews Street, Suite 102  
Langley AFB VA 23665-2969

The Honorable Nora Helton  
Tribal Chairperson, Fort Mojave Tribe  
500 Merriman Avenue  
Needles CA 92363

Dear Ms. Helton:

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada. In support of this process we graciously request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. In addition, if your agency has recently completed, is currently implementing, or is planning to undertake any new activities which you believe should be included as part of our cumulative impact analysis, we ask you to identify the activity and provide a point of contact.

ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The Predator UAV allows the Air Force to pursue strategic investigations and to detect potential targets without jeopardizing pilots or crews. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.

To support the beddown, approximately 200 additional personnel would be assigned and the Air Force would construct additional hangars, maintenance facilities, munitions storage, and office space at ISAFAF. Existing facilities would be expanded, improvements would be made to roadways and the aircraft-parking apron, the north end of Runway 13-31 would be extended by 400 feet, and the east gate would be upgraded to become the main gate.

Please forward any identified issues or concerns to Sheryl Parker, Predator EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334 or the Nellis AFB point of contact, Mr. Jim Campe. He may be reached at 99 CES/CEV, 4349 Duffer Drive, Ste 1601, Nellis AFB, Nevada 89191 or at (702) 652-5813. We cordially request comments be submitted by 18 March 03; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible. We anticipate a draft EA will be available for tribal, public, and agency comment this spring.

*Alton Chavis*

ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment  
Location Map

*Global Power For America*



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

18 FEB 2003

MEMORANDUM FOR: Mr. Robert Williams  
Field Supervisor  
U.S. Fish and Wildlife Service  
Nevada Ecological Field Office  
1340 Financial Blvd - Room 234  
Reno NV 89108

FROM: HQ ACC/CEVP  
129 Andrews St., Suite 102  
Langley AFB VA 23665-2969

SUBJECT: Force Structure Changes at Indian Springs Air Force Auxiliary Field, Nevada

1. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAP), Nevada. ISAFAP is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.
2. Pursuant to analysis of the proposed action and in compliance with the Endangered Species Act, we are requesting information regarding federally listed threatened, endangered, candidate, and proposed to be listed species that occur or may occur in the potentially affected area. Please provide your response to Science Applications International Corporation (SAIC), Force Structure Change ISAFAP EA, 525 Anacapa Street, Santa Barbara CA 93101. We would appreciate you identifying a point of contact for any follow-up questions we may have concerning the data you provide.
3. If you have any specific concerns about the proposal, we would like to hear from you. Please contact the EA Project Manager, Sheryl Parker at the above address or at (757) 764-9334. Thank you for your assistance in this matter.

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment  
Location Map

*Global Power For America*



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AFB FORCE BASE VIRGINIA

18 FEB 2003

MEMORANDUM FOR: Ms. Heather Elliott  
Nevada State Clearinghouse  
Department of Administration  
209 East Mumusser Street, Room 200  
Carson City NV 89701

FROM: HQ ACC/CEVP  
129 Andrews St., Suite 102  
Langley AFB VA 23665-2969

SUBJECT: Force Structure Change at Indian Springs Air Force Auxiliary Field, Nevada

1. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAF), Nevada. In support of this process we graciously request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. In addition, if your agency has recently completed, is currently implementing, or is planning to undertake any new activities which you believe should be included as part of our cumulative impact analysis, we ask you to identify the activity and provide a point of contact.

2. ISAFAF is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The Predator UAV allows the Air Force to pursue strategic investigations and to detect potential targets without jeopardizing pilots or crews. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.

3. To support the beddown, approximately 200 additional personnel would be assigned and the Air Force would construct additional hangars, maintenance facilities, munitions storage, and office space at ISAFAF. Existing facilities would be expanded, improvements would be made to roadways and the aircraft-parking apron, the north end of Runway 13-31 would be extended by 400 feet, and the east gate would be upgraded to become the main gate.

4. Please forward any identified issues or concerns to Sheryl Parker, Predator EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334. We cordially request comments be submitted by 18 March 03; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible. We anticipate a draft EA will be available for tribal, public, and agency comment this spring.

*Alton Chavis*

ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment  
Location Map



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 FEB 2003

MEMORANDUM FOR: Indian Springs Community Center  
719 Gretta Lane  
Indian Springs NV 89018

FROM: HQ ACC/CEVP  
129 Andrews St., Suite 102  
Langley AFB VA 23665-2969

SUBJECT: Force Structure Change at Indian Springs Air Force Auxiliary Field, Nevada

1. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for proposed force structure changes at Indian Springs Air Force Auxiliary Field (ISAFAP), Nevada. In support of this process we graciously request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. In addition, if your agency has recently completed, is currently implementing, or is planning to undertake any new activities which you believe should be included as part of our cumulative impact analysis, we ask you to identify the activity and provide a point of contact.
2. ISAFAP is located approximately 45 miles northwest of Las Vegas, Nevada within the Nevada Test and Training Range. The proposal provides for beddown of additional Predator Unmanned Aerial Vehicle (UAV) units and potential beddown of T-3 trainer aircraft. The Predator UAV allows the Air Force to pursue strategic investigations and to detect potential targets without jeopardizing pilots or crews. The T-3 trainer provides proficiency training for UAV pilots and supports UAV mission-specific training tasks.
3. To support the beddown, approximately 200 additional personnel would be assigned and the Air Force would construct additional hangars, maintenance facilities, munitions storage, and office space at ISAFAP. Existing facilities would be expanded, improvements would be made to roadways and the aircraft-parking apron, the north end of Runway 13-31 would be extended by 400 feet, and the east gate would be upgraded to become the main gate.
4. Please forward any identified issues or concerns to Sheryl Parker, Predator EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334. We cordially request comments be submitted by 18 March 03; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible. We anticipate a draft EA will be available for tribal, public, and agency comment this spring.

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment  
Location Map

*Global Power For America*

**A-4.      Agency Scoping Letters**





**DEPARTMENT OF ADMINISTRATION**

209 E. Musser Street, Room 200

Carson City, Nevada 89701-4298

Fax (775) 684-0260

(775) 684-0209

March 18, 2003

Ms. Sheryl Parker, Predator EA Project Manager  
HQ ACC/CEVP  
129 Andrews St., Suite 102  
Langley, AFB VA 23665-2969

Re: SAI NV # E2003-093

Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

Dear Ms. Parker:

Enclosed are the comments from the Nevada Division of Water Resources concerning the above referenced report. These comments constitute the State Clearinghouse review of this proposal as per Executive Order 12372. Please address these comments or concerns in your final decision. If you have questions, please contact me at 684-0209.

Sincerely,

A handwritten signature in cursive script that reads "Heather K. Elliott".

Heather K. Elliott  
Nevada State Clearinghouse/SPOC

# NEVADA STATE CLEARINGHOUSE

Department of Administration  
Budget and Planning Division  
209 East Musser Street., Room 200  
Carson City, Nevada 89701-4298  
(775) 684-0209  
Fax (775) 684-0260

DATE: February 26, 2003

Governor's Office  
Agency for Nuclear Projects  
Energy  
Agriculture  
Business & Industry  
Minerals  
Economic Development  
Tourism  
Fire Marshal  
Human Resources  
Aging Services  
Health Division  
Indian Commission  
Colorado River Commission

Legislative Counsel Bureau  
Information Technology  
Emp. Training & Rehab Research Div  
PUC  
Transportation  
UNR Bureau of Mines  
UNR Library  
UNLV Library  
Historic Preservation  
Emergency Management  
Office of the Attorney General  
Washington Office  
Nevada Assoc. of Counties  
Nevada League of Cities  
Nellis AFB

Conservation-Natural Resources  
Director's Office  
State Lands  
Environmental Protection  
Forestry  
Wildlife  
Region 1  
Region 2  
Region 3  
Conservation Districts  
State Parks  
Water Resources  
Natural Heritage  
Wild Horse Commission

Nevada SA # E2003-093

Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

## CLEARINGHOUSE NOTES:

Enclosed, for your review and comment, is a copy of the above mentioned project. Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local preawade goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than **March 13, 2003**. Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SA number and comment due date for our reference. Questions? Heather Elliott, 684-0209.

## THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

- ☐ No comment on this project  
☐ Proposal supported as written  
☐ Additional information below  
☐ Conference desired (See below)  
☐ Conditional support (See below)  
☐ Disapproval (Explain below)

## AGENCY COMMENTS:

All waters of the State belong to the public and may be appropriated for beneficial use pursuant to the provisions of Chapters 533 and 534 of the Nevada Revised Statutes and not otherwise. Underground water for quasi-municipal use must be appropriated by means of the application process through the Office of the State Engineer. Indian Springs Valley is over appropriated and the State Engineer may not allow any new appropriations of water. In that case existing water rights must be purchased or leased and applications (permanent or temporary) to change the point of diversion, place and/or manner of use must be filed with the office of the State Engineer. The State Engineer may deny applications of underground water in areas where there is a municipal water source available.

William McCullars

Nevada Division of Water Resources

03/14/2003

Signature

\\ntb\ntb\clear\clear.doc

Agency

Date

# NEVADA STATE CLEARINGHOUSE

Department of Administration  
Budget and Planning Division  
209 East Musser Street., Room 200  
Carson City, Nevada 89701-4298  
(775) 684-0209  
Fax (775) 684-0260

**NY-0495-03**  
**RECEIVED**  
**FEB 27 2003**  
HEALTH PROTECTION SERVICES

DATE: February 26, 2003

Governor's Office  
Agency for Nuclear Projects  
Energy  
Agriculture  
Business & Industry  
Minerals  
Economic Development  
Tourism  
Fire Marshal  
Human Resources  
Aging Services  
Health Division  
Indian Commission  
Colorado River Commission

Legislative Counsel Bureau  
Information Technology  
Emp. Training & Rehab Research Div  
PJC  
Transportation  
UNR Bureau of Mines  
UNR Library  
UNLV Library  
Historic Preservation  
Emergency Management  
Office of the Attorney General  
Washington Office  
Nevada Assoc. of Counties  
Nevada League of Cities  
Nellis AFB

## Conservation-Natural Resources

Director's Office  
State Lands  
Environmental Protection  
Forestry  
Wildlife  
Region 1  
Region 2  
Region 3  
Conservation Districts  
State Parks  
Water Resources  
Natural Heritage  
Wild Horse Commission

Nevada SAI # E2003-093

Project: Force Structure Change at Indian Springs Air Force Auxiliary Field



## CLEARINGHOUSE NOTES:

Enclosed, for your review and comment, is a copy of the above mentioned project. Please evaluate it with respect to its effect on your plans and programs, the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than **March 17, 2003**. Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Heather Elliott, 684-0209.

## THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

☐ No comment on this project  
☐ Proposal supported as written  
☐ Additional information below  
☐ Conference desired (See below)  
☐ Conditional support (See below)  
☐ Disapproval (Explain below)

## AGENCY COMMENTS:

The Bureau of Health Protection Services comments: Compliance with NAC 445A.65505 through 445A.67765, Design and Construction for Public Water Systems, must be considered regarding the proposed project.

  
Signature \_\_\_\_\_  
Heather Elliott, Director

Health Division  
Agency

3-31-03  
Date



**DEPARTMENT OF ADMINISTRATION**

209 E. Musser Street, Room 200  
Carson City, Nevada 89701-4298  
Fax (775) 684-0260  
(775) 684-0209

April 8, 2003

Ms. Sheryl Parker, Predator EA Project Manager  
HQ ACC/CEVP  
129 Andrews Street, Suite 102  
Langley AFB, VA 23665-2969

Re: SAI NV #E2003-093

Project: Force Structure Change at Indian Springs Air Force Auxiliary Field

Dear Ms. Parker:

Attached is an additional comment from the Nevada State Health Division, Bureau of Health Protection Services, which was received after our previous letter to you. Please incorporate this comment into your decision making process. If you have any questions, please contact me at (775) 684-0209.

Sincerely,

*Heather K. Elliott*  
for Heather K. Elliott  
Nevada State Clearinghouse/SPOC

Attachment



KENNY C. CAHAN  
Governor

SCOTT K. BRON  
Interim Governor

STATE OF NEVADA  
DEPARTMENT OF CULTURAL AFFAIRS  
Nevada State Historic Preservation Office  
100 N. Stewart Street  
Carson City, Nevada 89701

HONALD M. JAMES  
State Historic Preservation Officer

March 25, 2003

Alton Chavis  
Chief Environmental Analysis Branch  
HQ ACC/CEVP  
129 Andrews St. Suite 102  
Langley AFB VA 23665-2969

RE: Force Structure Changes at Indian Springs Air Force Auxiliary Field, Indian Springs Area, Clark County.

Dear Alton Chavis:

The Nevada State Historic Preservation Office (SHPO) reviewed your request for comments on the proposed alterations to the Indian Springs complex. The SHPO notes that the complex has been inventoried for cultural resources and numerous eligible architectural and archaeological resources were recorded as a result of this effort. If any of these properties are still present, the SHPO recommends that the effect of the expansion should be considered in the planning process.

The SHPO could not determine if the area for the proposed expansion of the north end of Runway 13-31 has been surveyed for cultural resources. If this area has not been inventoried, the SHPO would recommend an archaeological inventory of the project area.

If you have any questions concerning this correspondence, please contact me by phone at (775) 684-3443 or by E-mail at [rlpalmer@clan.lib.nv.us](mailto:rlpalmer@clan.lib.nv.us).

Sincerely,

Rebecca Lynn Palmer  
Historic Preservation Specialist



KENNY C. GUINN  
Comptroller

STATE OF NEVADA  
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

**DIVISION OF WILDLIFE**

1100 Valley Road  
Hend, Nevada 89512  
(775) 680-1580 • Fax (775) 680-1586

R. MICHAEL TURNIPSEED, P.E.  
Director  
Department of Conservation  
and Natural Resources

TERRY R. CRAWFORTH  
Administrator

SOUTHERN REGION  
4747 WEST VEGAS DRIVE  
LAS VEGAS, NEVADA 89108  
(702) 486-5127; 486-5133 FAX

March 31, 2003

Mr. Michael Estrada  
Project Officer, Air Warfare Center  
4370 N Washington Blvd Ste. 117  
Nellis AFB NV 89191-7076

RE: Indian Springs Air Force Auxiliary Field force structure changes

Dear Mr. Estrada:

Thank you for bringing this public notice to our attention. The Nevada Division of Wildlife (NDOW) recognizes the importance of testing and training for our armed forces, particularly during wartime. We do not anticipate any long-term, significant negative impacts to wildlife species or habitats of concern as a result of this project. There are sparse stands of Catclaw acacia (*Acacia greggii*) and Mesquite (*Prosopis*, sp.) on the south side of U.S. 95 adjacent to the airfield that is potential habitat for neo-tropical migrating bird species. For information on protected plant species in Nevada, you may want to contact Mr. John Jones of the Nevada Division of Forestry at:

Nevada Division of Forestry  
4747 W. Vegas Drive  
Las Vegas, NV 89108  
(702) 486-5123

As for animal and plant species afforded protection under the Federal Endangered Species Act of 1973, you may find it helpful to contact the local office of the U.S. Fish and Wildlife Service at:

U.S. Fish and Wildlife Service  
Nevada Ecological Services  
4701 N. Torrey Pines Dr.  
Las Vegas, NV 89130  
(702) 451-5290

If you have any questions, I can be contacted at (702) 486-5127 ext. 3613. Again, thank you for the opportunity to comment on this project relative to Nevada's wildlife and habitat resources.

Sincerely,  
  
Roddy Sheppard  
Habitat Biologist

RS:rs

cc:

NDOW, Game Bureau  
NDOW, Habitat Bureau

## **Appendix B**

---

---

### **Statutes, Regulations, and Guidelines**



## **APPENDIX B**

### **RELEVANT STATUTES, REGULATIONS, AND GUIDELINES**

#### **GENERAL**

*National Environmental Policy Act (NEPA) of 1969* (Public Law 91-190, 42 U.S.C. 4347, as amended) requires federal agencies to take the environmental consequences of proposed actions into consideration in their decisionmaking process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process.

*32 CFR 989, et seq., Environmental Impact Analysis Process* (formerly known as Air Force Instruction [AFI] 32-7061) is the Air Force implementation of the procedural provisions of the NEPA and CEQ regulations.

*AFPD 32-70, Environmental Quality*, requires that the Air Force comply with applicable federal, state, and local environmental laws and regulations, including NEPA. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality, as amended by EO 11991, sets policy directing the federal government in providing leadership in protecting and enhancing the environment.

*Executive Order 12372 (Intergovernmental Review of Federal Programs)* directs federal agencies to "make efforts to accommodate state and local elected officials' concerns with proposed . . . direct federal development." It further states, "for those cases where the concerns cannot be accommodated, federal officials shall explain the bases for their decision in a timely manner." The executive order requires federal agencies to provide state and local officials the opportunity to comment on actions that could affect their jurisdictions, using state-established consultation processes when possible.

#### **AIRSPACE**

*Federal Aviation Act of 1958* created the Federal Aviation Administration (FAA) and charged the FAA Administrator with ensuring the safety of aircraft and the efficient utilization of the National Airspace System, within the jurisdiction of the United States.

*Federal Aviation Regulation (Part 71)* (1975) delineates the designation of federal airways, area low routes, controlled airspace, and navigational reporting points.

*Federal Aviation Regulation (Part 73)* (1975) defines special use airspace and prescribes the requirements for the use of that airspace.

---

---

*Federal Aviation Regulation (Part 91)* (1990) describes the rules governing the operation of aircraft within the United States.

*FAA Handbook 7400.2C* prescribes policy, criteria, and procedures applicable to rulemaking and non-rulemaking actions associated with airspace allocation and utilization, obstruction evaluation and marking airport airspace analyses, and the establishment of air navigation aids.

*FAA Handbook 7110.65* prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services in the United States.

## **SAFETY**

*AFI 32-2001* defines the requirements for Air Force installation fire protection programs, including equipment, response times, and training.

*AFI 32-3001, Explosive Ordnance Disposal Program* (1 October 1999), regulates and provides procedures for explosives safety and handling.

*AFI 91-202, the U.S. Air Force Mishap Prevention Program* (1 August 1998) established mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information.

*AFI 91-301* contains Air Force occupational safety, fire prevention, and health regulations governing a wide range of activities and procedures associated with safety in the workplace.

*Air Force Manual 91-201* regulates and provides procedures for explosives safety and handling. This manual defines criteria for quantity distances, clear zones, and facilities associated with ordnance.

*Department of Defense (DOD) Flight Information Publication* indicates locations of potential hazards (e.g., bird aggregations, obstructions) and noise sensitive locations under military airspace, and defines horizontal and/or vertical avoidance measures. This publication is updated monthly to present current conditions.

## **MATERIALS MANAGEMENT**

*Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980*, and *SARA of 1986* provide liability and compensation for cleanup and emergency

response from hazardous substances discharged into the environment and the cleanup of hazardous disposal sites.

*Resource Conservation and Recovery Act (RCRA) of 1976* regulates storage, transportation, treatment, and disposal of hazardous waste that could adversely affect the environment.

*Solid Waste Disposal Act (SWDA) and Amendments of 1980* amends RCRA with additional regulation of energy and materials conservation and the establishment of a National Advisory Council.

*AFI 32-4002 (Hazardous Material, Emergency Planning and Response Program)* (December 1997)

*AFI 32-7005 Facility Environmental Protection Committee* (25 February 1994).

*AFI 32-7042 (Solid and Hazardous Waste Compliance)* (May 1994)

*AFI 32-7080 (Pollution Prevention Program)* (May 1994)

*AFI 32-7086 (Hazardous Material Management)* (August 1997)

*Military Munitions Rule, Title 40 CFR Part 266, Subpart M.*

## **PHYSICAL RESOURCES**

*Federal Water Pollution Control Act of 1948.* Establishes procedures and programs for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters, thus protecting habitat conditions in aquatic and wetland ecosystems.

*Clean Water Act of 1977 (33 USC section 1251 et seq.)* requires that any point source waste that discharges into waters of the U.S. requires a National Pollutant Discharge Elimination System (NPDES) permit. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers prior to such activities.

*Executive Order 11988 (Flood Plain Management)* directs that "any federally undertaken, financed, or assisted construction project must provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This order requires each federal agency to determine whether the project will occur in a floodplain and to consider alternatives. If no practical alternative is

---

---

found, it requires minimizing harm and notifying the public as to why the project must be located in the floodplain. It also provides for public review and comment.

*Safe Drinking Water Act of 1974 (42 USC section 300f et seq.)* requires the Environmental Protection Agency (EPA) to establish a program which provides for the safety of the nation's drinking water. Regulations under this act can be found in 40 CFR, section 141 et seq.

## **BIOLOGICAL RESOURCES**

*Executive Order 11990 (Protection of Wetlands)* (1977) requires that leadership shall be provided by involved agencies to minimize the destruction, loss, or degradation of wetlands. The order was issued to "avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands whenever there is a practicable alternative." Federal agencies are required to provide for early public review of any plans or proposals for new construction in wetlands.

*AFI 32-7064 (Integrated Natural Resources Management)* implements Air Force Policy Directive 32-70, Environmental Quality. This instruction explains how to manage natural resources on Air Force property in compliance with federal, state, and local standards in the U.S. and U.S. territories and possessions.

*Bald Eagle Protection Act* (16 USC 668-668d) addresses the protection of bald and golden eagles and specifies criminal penalties.

*Endangered Species Act of 1973* (16 USC section 1531 et seq. as amended) protects proposed and listed threatened or endangered species. Formal consultation with the U.S. Fish and Wildlife Service (USFWS) is required under Section 7 of the act for federal projects and all other projects that require federal permits (e.g., U.S. Army Corps of Engineers permits) where such actions could directly or indirectly affect any proposed or listed species.

*Executive Order 12088 (Federal Compliance with Pollution Control Standards)* (1988) requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

*Fish and Wildlife Conservation Act (1980)* promotes state programs to conserve, restore, and benefit non-game fish and wildlife and their habitat.

***Migratory Bird Treaty Act of 1972 (16 USC sections 703 through 711)*** federally protects all birds including (but not limited to) hawks, eagles, falcons, shorebirds, wading birds, owls, waterfowl, and songbirds by limiting the transportation, importation, killing, or possession of those birds.

## **AIR QUALITY**

***Clean Air Act (Title 40 CFR parts 50 and 51)***, amended in August 1977 and November 1990, dictates that the National Ambient Air Quality Standards (NAAQS) must be maintained nationwide. The Act delegates authority to state and local agencies to enforce the NAAQS and to establish air quality standards and regulations of their own. The adopted state standards and regulations must be at least as restrictive as the federal requirements. Air pollution sources within the study area are regulated by the Nevada Department of Environmental Protection. Although mobile sources such as aircraft are exempt from air pollution permitting requirements, the operation of these sources must comply with state and federal regulation and the ambient air quality standard.

***Executive Order 12088 (Federal Compliance with Pollution Control Standards)*** requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

## **CULTURAL RESOURCES**

***National Historic Preservation Act (NHPA) of 1966*** establishes National Register of Historic Places (National Register) and defines the Section 106 process requiring federal agencies to consider effects of an action on cultural resources on or eligible for the National Register.

***Protection of Historic and Cultural Properties (36 CFR section 800) (1986)*** provides an explicit set of procedures for federal agencies to meet their obligations under the NHPA and Executive Order 11593.

***Native American Graves Protection and Repatriation Act (NAGPRA) (1990) (25 USC 3001-3013)*** requires protection and repatriation of Native American cultural items found on, or taken from federal or tribal lands, and requires repatriation of cultural items controlled by federal agencies or museums receiving federal funds.

***Archaeological Resources Protection Act (ARPA) of 1979 (16 USC section 470aa-47011)*** ensures the protection and preservation of archaeological sites on federal or Native American lands.

---

---

*AFI 32-7065 (Cultural Resources Management)* implements Air Force Policy Directive 32-70, Environmental Quality. This instruction sets guidelines for protecting and managing cultural resources in the United States and U.S. territories and possessions.

*Executive Order 13007* (1996) directs agencies responsible for managing federal lands to, “(1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.” The order also requires that reasonable notice is given for proposed actions or policies potentially restricting access to, or adversely affecting sacred sites.

*AF Manual 126-5 (Natural Resources, Outdoor Recreation, and Cultural Values)* provides guidance, standards, and technical information on management of natural resources, outdoor recreational resources, and cultural resources.

*AF Policy Letter (4 January 1982)* establishes that it is Air Force policy to comply with historic preservation and other federal environmental laws and directives, including Historic Sites Act of 1935; NHPA of 1966, as amended; NEPA of 1969; Archaeological and Historic Preservation Act of 1974; ARPA of 1979; and Executive Order 11593.

*American Indian Religious Freedom Act (AIRFA)* (1978) (42 USC section 1996) states that it is the policy of the U.S. to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

*Executive Order 11593* (1971) directs land-holding federal agencies to identify and nominate historic properties to the National Register and requires that these agencies should avoid damaging historic properties that might be eligible for the National Register.

## **ENVIRONMENTAL JUSTICE**

*Executive Order 12898 (Environmental Justice)* directs federal agencies to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations in the United States and its territories and possessions. The order creates an Interagency Working Group on Environmental Justice and directs each federal agency to develop strategies within prescribed time limits to identify and address environmental justice concerns. The order further directs each federal agency to collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have a substantial environmental, human

health, or economic effect on the surrounding populations, when facilities or sites become the subject of a substantial federal environmental administrative or judicial action and to make such information publicly available.

*EO 13045 Protection of Children from Environmental Health Risks and Safety Risks (1998)* directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

*AF Guidance, Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process* (November 1997) provides guidance for implementation of EO 12898 in relevant Air Force environmental impact assessments.

---

This page intentionally left blank.

## **Appendix C**

---

---

# **Environmental Restoration Program Waiver**



**NOTE:** An Environmental Restoration Program (ERP) waiver letter has been submitted to Headquarters Air Combat Command (ACC). Approval is expected by June 2003.  
A copy will be provided in the Final EA.



## **Appendix D**

---

---

### **Air Quality Technical Appendix**



## **APPENDIX D**

### **AIR QUALITY TECHNICAL REPORT**

The approach to the air quality analysis was to estimate the change in emissions due to the proposed action and alternatives. Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. Air quality impacts from a proposed activity or action would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- impair visibility within any federally mandated PSD Class I area.

In attainment areas, Prevention of Significant Deterioration (PSD) rules define a stationary source as "major" if annual emissions exceed 250 tons per year of VOCs, NO<sub>x</sub>, CO, SO<sub>x</sub>, or PM<sub>10</sub>. In serious nonattainment areas, New Source Review (NSR) rules define a stationary source as "major" if annual emissions exceed 50 tons of VOCs or NO<sub>x</sub> and 100 tons of CO, sulfur oxides (SO<sub>x</sub>), or PM<sub>10</sub>. For purposes of this air quality analysis, project emissions would be potentially significant if they exceed one of these thresholds. This is a conservative approach, as the project includes both stationary and mobile (non-permitted) emission sources, whereas these thresholds only apply to stationary sources.

According to the USEPA General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal action that has the potential to impact air quality, as described above, in a nonattainment or maintenance area must undergo a conformity analysis. Under this rule, air quality impacts would be potentially significant if project emissions exceed one of the thresholds that trigger a conformity analysis (70 tons per year of PM<sub>10</sub> and 100 tons per year of CO for CO and PM<sub>10</sub> serious nonattainment areas). A conformity analysis is not required in an attainment area. Since ISAFAF is located outside of the nonattainment area in Clark County, a conformity analysis is not required for activities occurring in the Indian Springs locale. Emissions from the proposed construction of munitions storage structures at Nellis AFB would be potentially significant if they exceed the conformity thresholds described above, since these activities occur in a nonattainment area.

As previously discussed, Section 169A of the CAA established the PSD regulations to protect the air quality in regions that already meet the NAAQS. Certain national parks, monuments, and wilderness areas have been designated as PSD Class I areas, where appreciable deterioration in air quality is considered significant. The nearest PSD Class I area is the Grand Canyon National Park in Arizona, which is located approximately 100 miles east from the region potentially affected by the proposed action and alternatives. Therefore, the proposed action would not have a significant impact on a PSD Class I area.

#### **1.0 ALTERNATIVE A**

Alternative A involves the beddown of additional Predator medium altitude (MQ-1) and the introduction of high altitude (MQ-9) endurance UAVs at the ISAFAF. Under this alternative,

some new facilities would be built and others would be modified to accommodate the Predator aircraft's support and maintenance requirements. The addition of UAV would result in an increase of aircraft operations and emissions resulting from these operations. The proposed action would result in an increase of 101 full-time personnel. Construction and renovation activities would occur at the site to accommodate the additional aircraft, including extension of Runway 13/31. Stationary air emission sources such as generators for the ground support equipment (GSE) would also occur at the site as necessary to accommodate the aircraft.

### 1.1 Construction Emissions

Under Alternative A, construction activities at ISAF AF include grading and construction of facilities, taxiway and runway with a combined floor space of approximately 837,000 square feet. These construction activities would occur over a 4-year period and would produce short-term combustive and fugitive dust emissions, which would cease once construction is completed. Construction activities at Nellis AFB include grading and construction of three munitions storage structures. These activities would occur during FY06.

Emissions of VOC, NO<sub>x</sub>, CO, and PM<sub>10</sub> from construction activities were calculated using emission factors for grading and for general industrial construction (SCAQMD 1993). These emissions include exhaust emissions from on-site construction equipment as well as fugitive dust emissions from grading activities. A summary of the annual construction emissions for each construction year is presented in Table 1.

**Table 1. Annual Construction Emissions under Alternative A**

<i>Construction</i>	<i>CRITERIA POLLUTANTS EMISSIONS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub>*</i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
FY 03 Construction Projects (ISAF AF)	12.3	NA	46.3	61.3	3.7
FY 04 Construction Projects (ISAF AF)	6.5	NA	29.8	60.1	2.0
FY 05 Construction Projects (ISAF AF)	7.5	NA	31.4	60.2	2.3
FY 06 Construction Projects (ISAF AF)	9.9	NA	45.7	61.2	3.1
FY 06 Construction Projects (Nellis AFB)	0.4	NA	1.7	0.1	0.1
Emission factor for SO <sub>2</sub> is not available. SO <sub>2</sub> emissions from construction activities, however, are expected to be insignificant.					

As shown in Table 1, construction operations at ISAF AF would generate emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC well below the PSD threshold of 250 tons per year. Construction operations at Nellis AFB would also generate low-level emissions, well below the conformity thresholds of 50 tons of VOCs or NO<sub>x</sub> and 100 tons of CO, sulfur oxides (SO<sub>x</sub>), or PM<sub>10</sub>. The actual emissions are likely to be less than the estimated emissions (Table 1) due to implementation of additional control measures in concert with standard Best Management Practices (BMPs). For instance, frequent spraying of water on exposed soil during construction is a standard procedure that could be used to minimize the amount of dust generated during construction. Combustive and fugitive dust emissions would produce localized, short-term elevated air pollutant concentrations, which would not result in long-term impacts on the air quality of Clark County.

## 1.2 Commuter Vehicle Emissions

The current use of Air Force buses to transport commuting personnel from the Las Vegas area to ISAFAF would continue under the proposed action. This commuting practice is expected to reduce the number of privately owned vehicles (POVs) operating from the Las Vegas area on the U.S. 95 corridor. The number of buses used for commuting is based upon the number of personnel desiring the service and the pick-up points along the route of transport. For calculation purposes, it was assumed that 75 percent of commuting personnel would drive to a pick-up point along the U.S. 95 and take a bus to ISAFAF, while the remaining 25 percent would commute to ISAFAF in POVs. An average bus capacity of 50 persons was assumed.

Implementation of the proposed action under Alternative A would result in the addition of 101 full-time personnel at ISAFAF. The resultant increase in commuting emissions, due to vehicular travel by these new full-time personnel to and from the base, were calculated using emission factors from *Calculation Methods for Criteria Pollutant Emission Inventories* (Jagelski and O'Brien 1994). All POVs were assumed to be light-duty, gasoline-powered vehicles with 1995 as the average vehicle model year. All busses were assumed to be heavy duty, diesel-powered vehicles with 1995 as the model year. Annual criteria pollutant emissions from vehicles commuting of 101 full-time personnel to and from ISAFAF, assuming an average round-trip commuting distance of 90 miles from the Las Vegas area, are shown in Table 2.

**Table 2. Emissions from Commuter Vehicles under Alternative A**

Source	POLLUTANTS (TONS PER YEAR)				
	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	VOC
Commuting POVs	15.8	0.004	1.3	0.06	2.2
Commuting Busses	0.7	0.003	0.4	0.06	0.2
<b>Total Emissions</b>	<b>16.4</b>	<b>0.01</b>	<b>1.7</b>	<b>0.1</b>	<b>2.3</b>

As shown in Table 2, emissions from commuting vehicles to and from ISAFAF would generate low-level emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC, well below the PSD threshold of 250 tons per year. Since emissions from commuting vehicles would be spread over a 45-mile distance, they would not result in long-term impacts on the air quality of Clark County.

## 1.3 Aircraft Operations

Under Alternative A, the beddown of additional Predator UAVs would result in an increase of 1,908 sorties per year in the NTTR airspace and 786 sorties per year in the R-2508 airspace in California. Aircraft sorties for the Predator UAVs include takeoff and landing (LTO), touch and go (TGO), and transit and mission operations. All LTOs and TGOs would occur at ISAFAF. Predators would take off at ISAFAF and transit in the NTTR airspace at an altitude of 15,000 feet or greater. Some Predator sorties would take off at ISAFAF and fly at an altitude of 15,000 feet or greater to the R-2508 Range Complex north of Edwards AFB, in California, for transit and mission, and then come back to land at ISAFAF.

At this time, published emission data are not available for the Predator Rotax engines. Emission factors for similar engines from EPA's AP-42 document (Vol. II) (EPA, 1992) were

used to estimate emissions from the Predator. The emission factor for the Lycoming O-320 engine was used to calculate emissions from the RQ-1 and MQ-1 UAVs. This engine is used on the Piper PA-18 aircraft. The emission factor for the DeHaviland PT-6A-27 was used to calculate emissions from the MQ-9 UAVs. This engine is used on the UV-18A aircraft.

Emissions from aircraft LTO and TGO operations were estimated based on the assumption that each sortie would consist of one LTO and five TGOs and would last a total of 6 hours. LTO and TGO operations would result in emissions within the ISAFAP locale. Emissions from transit and mission operations in NTTR and R-2508 airspace were estimated based on the assumption that the Predators would spend 4.5 hours in NTTR airspace and 4 hours in R-2508 airspace. However, these emissions would occur at an altitude of 15,000 feet or greater, well above the mean maximum mixing heights for those areas, which are 2,000 feet (winter) to 12,000 feet (summer) for NTTR and 3,000 feet (winter) to 8,000 feet (summer) for R-2508 (Holzworth, 1964). Therefore, emissions from transit and mission operations would not impact the air quality of the NTTR and R-2508 locales, since they would occur at a very high altitude and would spread out over large areas. A summary of emissions from proposed aircraft operations under Alternative A is presented in Table 3.

**Table 3. Emissions from Aircraft Operations under Alternative A**

Source	POLLUTANTS (TONS PER YEAR)				
	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	VOC
<i>BASILINE</i>					
LTO and TGOs (ISAFAP)	56.1	0.01	0.1	0.05	0.8
NTTR	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3
<i>ALTERNATIVE A</i>					
LTO and TGOs (ISAFAP)	159.1	0.1	0.9	0.2	2.5
NTTR	396.8	0.2	3.6	0.7	5.0
R-2508	113.3	0.1	1.0	0.2	1.4
<i>INCREASE FROM BASILINE</i>					
LTO and TGOs (ISAFAP)	103.0	0.1	0.8	0.2	1.8
NTTR	236.6	0.2	2.9	0.5	3.0
R-2508	90.4	0.1	0.9	0.2	1.1

As shown in Table 3, LTO and TGOs aircraft operations at ISAFAP would generate emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC below the PSD threshold of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County. Emissions from transit and mission operations in NTTR and R-2508 airspace would not affect ground level air quality, since they would occur at a very high altitude (above the mean maximum mixing height for those areas) and would spread out over large areas.

## 1.4 Ground Support Equipment (GSE)

Emissions from GSE under Alternative A were calculated based on the emission data and assumptions provided in the 1996 EA for the beddown of 25 additional Predators at ISAFAF (USAF 1996). Under this alternative, an increase of 2,694 sorties per year for Predator UAVs operating out of ISAFAF would occur. It was assumed that no more than two 40 kW GSE generators would be running at one time. For calculation purposes, it was assumed that for a typical aircraft sortie of 6 hours the generators would have to run for a period of 8 hours to complete the mission. Emission factors for generators from EPA's AP-42 document (Vol I) were used to calculate emissions from GSE. A summary of the emissions from GSE is presented in Table 4.

**Table 4. Emissions from Ground Support Equipment under Alternative A**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9

As shown in Table 4, GSE would generate low-level emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC, well below the PSD thresholds of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County.

## 1.5 Total Annual Operational Emissions under Alternative A

A summary of total annual operational emission increases from the implementation of Alternative A at ISAFAF is presented in Table 5.

**Table 5. Total Annual Operational Emission Increases under Alternative A**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Commuting Vehicles	16.4	0.01	1.7	0.1	2.3
Aircraft Operations (ISAFAF)	103.0	0.1	0.8	0.2	1.8
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9
<b>Total Emissions (ISAFAF)</b>	<b>127.2</b>	<b>2.4</b>	<b>38.2</b>	<b>2.8</b>	<b>6.9</b>

## 2.0 ALTERNATIVE B

As in Alternative A, this alternative involves the beddown of additional Predator UAVs at ISAFAF. The difference between this alternative and Alternative A is the number and type of Predator UAV that would be added. This would result a higher number of annual aircraft operations and an increase of 143 full-time personnel commuting to ISAFAF. Stationary air emission sources such as generators for GSE would also occur as necessary to accommodate the aircraft. The proposed action would result in the same construction and renovation activities required under Alternative A to accommodate the additional aircraft, including extension of Runway 13/31.

## 2.1 Construction Emissions

Emissions from construction activities under Alternative B would be the same as those presented in Table 1 for Alternative A. As shown in Table 1, construction operations at ISAFAF would generate emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC well below the PSD threshold of 250 tons per year. Construction operations at Nellis AFB would also generate low-level emissions, well below the conformity thresholds of 50 tons of VOCs or NO<sub>x</sub> and 100 tons of CO, sulfur oxides (SO<sub>x</sub>), or PM<sub>10</sub>. The actual emissions are likely to be less than the estimated emissions (Table 1) due to implementation of additional control measures in concert with standard construction practices. For instance, frequent spraying of water on exposed soil during construction is a standard procedure that could be used to minimize the amount of dust generated during construction. Combustive and fugitive dust emissions would produce localized, short-term elevated air pollutant concentrations, which would not result in long-term impacts on the air quality of Clark County.

## 2.2 Commuter Vehicle Emissions

Implementation of the proposed action under this alternative would result in the addition of 143 full-time personnel at ISAFAF. The resultant increase in commuting emissions, due to vehicular travel by these new personnel to and from the base, were calculated using emission factors from *Calculation Methods for Criteria Pollutant Emission Inventories* (Jagelski and O'Brien, 1994). All POVs were assumed to be light-duty, gasoline-powered vehicles with 1995 as the average vehicle model year. Busses were assumed to be heavy duty, diesel-powered vehicles with 1995 as the model year. Annual criteria pollutant emissions from vehicles commuting of 143 full-time personnel to and from ISAFAF, assuming an average round-trip commuting distance of 90 miles from the Las Vegas metropolitan area, are shown in Table 6.

**Table 6. Emissions from Commuter Vehicles under Alternative B**

Source	POLLUTANTS (TONS PER YEAR)				
	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	VOC
Commuting POVs	22.3	0.01	1.8	0.1	3.1
Commuting Busses	1.0	0.005	0.6	0.1	0.3
<b>Total Emissions</b>	<b>23.3</b>	<b>0.01</b>	<b>2.4</b>	<b>0.2</b>	<b>3.3</b>

As shown in Table 6, emissions from commuting vehicles to and from ISAFAF would generate low-level emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC, well below the PSD threshold of 250 tons per year. Since the emissions from commuting vehicles would be spread over a 45-mile distance, they would not result in long-term impacts on the air quality of Clark County.

## 2.3 Aircraft Operations

Emissions from aircraft operations for Alternative B were calculated based on the same emission data and assumptions provided under Alternative A. Under Alternative B, the beddown of additional Predator UAVs would result in an increase of 2,640 sorties per year in the NTTR airspace and 786 sorties per year in the R-2508 airspace. A summary of emissions from proposed aircraft operations under Alternative B is presented in Table 7.

**Table 7. Emissions from Aircraft Operations under Alternative B**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
<i>BASELINE</i>					
LTO and TGOs (ISAFAP)	56.1	0.01	0.1	0.05	0.8
NTTR	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3
<i>ALTERNATIVE B</i>					
LTO and TGOs (ISAFAP)	164.6	0.1	1.8	0.4	3.2
NTTR	427.1	0.5	7.0	1.2	5.3
R-2508	98.0	0.1	1.6	0.3	1.2
<i>INCREASE FROM BASELINE</i>					
LTO and TGOs (ISAFAP)	108.4	0.1	1.7	0.3	2.4
NTTR	267.0	0.4	6.4	1.0	3.3
R-2508	75.0	0.1	1.5	0.3	0.9

As shown in Table 7, LTO and TGOs aircraft operations at ISAFAP would generate emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC below the PSD threshold of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County. Emissions from transit and mission operations in NTTR and R-2508 airspace would not affect ground level air quality, since they would occur at a very high altitude (above the mean maximum mixing height for those areas) and would spread out over large areas.

## 2.4 Ground Support Equipment (GSE)

Emissions from GSE under this alternative were calculated based on the emission data and assumptions provided under Alternative A. Under this alternative, the beddown of additional Predator UAV would result in an increase of 3,426 sorties per year for Predator UAVs operating out of ISAFAP. A summary of the emissions from GSE is presented in Table 8.

**Table 8. Emissions from Ground Support Equipment under Alternative B**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6

As shown in Table 8, GSE at ISAFAP would generate low-level emissions of CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC, well below the PSD thresholds of 250 tons per year. These emissions would not result in long-term impacts on the air quality of Clark County.

## 2.5 Total Annual Operational Emissions under Alternative B

A summary of total annual operational emission increases from the implementation of Alternative B at ISAFAP is presented in Table 9.

**Table 9. Total Annual Operational Emission Increases under Alternative B**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Commuter Vehicles	23.3	0.01	2.4	0.2	3.3
Aircraft Operations (ISAFAP)	108.4	0.1	1.7	0.3	2.4
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6
<b>Total Emissions (ISAFAP)</b>	<b>141.5</b>	<b>3.2</b>	<b>49.5</b>	<b>3.7</b>	<b>9.3</b>

## 3.0 ALTERNATIVE C

Alternative C involves the beddown of 20 percent more Predator UAVs at ISAFAP. The reduced operational requirements would result in a decrease of approximately 560 personnel commuting to ISAFAP. Stationary air emissions sources such as generators would not be detectably different from the No Action Alternative. Alternative C includes the extension of Runway 13/31 to support Predator crosswind operation.

### 3.1 Construction Emissions

Under Alternative C, construction activities at ISAFAP include grading and construction of facilities, taxiway and runway with a combined floor space of approximately 304,000 square feet. These construction activities would occur during FY03, FY05, and FY06 and would produce short-term combusive and fugitive dust emissions, which would cease once construction is completed. A summary of the annual emissions from construction activities under Alternative C is presented in Table 10.

**Table 10. Annual Construction Emissions under Alternative C**

<i>Construction</i>	<i>CRITERIA POLLUTANTS EMISSIONS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub>*</i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
FY 03 Construction Projects (ISAFAP)	1.3	NA	1.5	28.2	0.4
FY 05 Construction Projects (ISAFAP)	0.9	NA	1.1	28.1	0.2
FY 06 Construction Projects (ISAFAP)	5.1	NA	21.0	29.6	1.6
* Emission factor for SO <sub>2</sub> is not available. SO <sub>2</sub> emissions from construction activities, however, are expected to be insignificant.					

As shown in Table 10, construction operations would generate low-level emissions for CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and VOC, well below the PSD threshold of 250 tons per year. In addition, these emissions are expected to be reduced through frequent spraying of exposed soil during

construction. Combustive and fugitive dust emissions would have minimal localized short-term effects and would not result in long-term air quality impacts on Clark County.

### 3.2 Commuting to and From ISAFAF

Alternative C reduces the number of full-time personnel at ISAFAF by approximately 560. The resulting reduction in commuting emissions to and from the base would result in lower emissions than under existing conditions. The decrease in emissions from commuting vehicles under Alternative C is presented in Table 11.

**Table 11. Emissions from Commuting Vehicles under Alternative C**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
Commuting POVs	-87.4	-0.02	-7.1	-0.3	-12.0
Commuting Busses	-3.7	-0.02	-2.2	-0.3	-1.0
<b>Total Emissions</b>	<b>-91.1</b>	<b>-0.04</b>	<b>-9.2</b>	<b>-0.7</b>	<b>-12.9</b>

### 3.3 Aircraft Operations

Alternative C emissions from aircraft operations were calculated based on the same emission data and assumptions presented under Alternative A. The beddown of eight additional Predator UAV would result in an increase of 256 sorties per year at ISAFAF. A summary of emissions from proposed aircraft operations under Alternative C is presented in Table 12.

**Table 12. Emissions from Aircraft Operations under Alternative C**

<i>Source</i>	<i>POLLUTANTS (TONS PER YEAR)</i>				
	<i>CO</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>VOC</i>
<i>BASELINE</i>					
LTO and TGOs (ISAFAF)	56.1	0.01	0.1	0.05	0.8
NTTR	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3
<i>ALTERNATIVE C</i>					
LTO and TGOs (ISAFAF)	41.0	0.1	1.0	0.2	1.1
NTTR	113.0	0.3	3.9	0.6	1.4
R-2508	16.2	0.04	0.6	0.1	0.2
<i>INCREASE FROM BASELINE</i>					
LTO and TGOs (ISAFAF)	-15.1	0.1	0.9	0.1	0.3
NTTR	-47.1	0.3	3.2	0.4	-0.6
R-2508	-6.7	0.04	0.5	0.1	-0.1

As shown in Table 12, LTO and TGOs aircraft operations at ISAF AF would generate very low emissions of  $SO_2$ ,  $NO_2$ ,  $PM_{10}$ , and VOC. Emissions of CO would decrease with the implementation of this alternative due to the different type of Predator UAVs (MQ-1 and RQ-1 vs. MQ-9) used compared to the baseline. These emissions would not result in long-term impacts on the air quality of Clark County. Emissions from transit and mission operations in the NTTR and R-2508 airspace would not affect ground level air quality, since they would occur at a very high altitude (above the mean maximum mixing height for those areas) and would spread out over large areas.

### 3.4 Ground Support Equipment (GSE)

Emissions from GSE from Alternative C were calculated based on emission data and assumptions presented for Alternative A. The beddown of additional Predator UAV would result in emissions from GSE presented in Table 13. This additional equipment would generate very low emissions for all categories and would not result in long-term consequences to air quality in Clark County.

**Table 13. Emissions from Ground Support Equipment under Alternative C**

Source	POLLUTANTS (TONS PER YEAR)				
	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	VOC
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3

### 3.5 Total Annual Operational Emissions Under Alternative C

Total annual operational emission increases resulting from the implementation of Alternative C at ISAF AF are presented in Table 14. The implementation of this alternative would result in a decrease of emissions of CO,  $NO_2$ ,  $PM_{10}$  and VOC compared to baseline, and insignificant emissions of  $SO_2$ . These emissions, therefore, would not result in significant long-term impacts on Clark County air quality.

**Table 14. Total Annual Operational Emission Changes under Alternative C**

Source	POLLUTANTS (TONS PER YEAR)				
	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	VOC
Commuter Vehicles	-91.1	-0.04	-9.2	-0.7	-12.9
Aircraft Operations (ISAF AF)	-15.1	0.1	0.9	0.1	0.3
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3
<b>Total Emissions (ISAF AF)</b>	<b>-105.5</b>	<b>0.3</b>	<b>-4.9</b>	<b>-0.3</b>	<b>-12.3</b>

## 4.0 NO ACTION ALTERNATIVE

Under the No Action Alternative, no additional Predator UAV would be added at ISAF AF. Therefore, no construction emissions and no emissions increase or decrease from the operational emissions associated with the current activities would result from this alternative.

Predator EA - Emission Calculations  
**Bldg Const- Alt A,B&C (ISAFAP)**

**Emission Factors**

Land Use	Unit of Measure	Emission Factors (lbs/construction period)			
		ROC	NOx	CO	PM10
General Industrial	1000 ft2 GFA	32.79	481.88	104.79	34.22

**Construction Data**

Fiscal Year	Alternatives A and B		Alternative C	
	Increased Area		Increased Area	
FY03	178060	sq ft		
FY04	123500	sq ft		
FY05	126000	sq ft		sq ft
FY06	189730	sq ft	84,000	sq ft
<b>Total</b>	<b>617290</b>	sq ft	<b>84000</b>	sq ft

**Annual Emissions (Alternatives A and B)**

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY03	5838.6	85803.6	18658.9	6093.2
FY04	4049.6	59512.2	12941.6	4226.2
FY05	4131.5	60716.9	13203.5	4311.7
FY06	6221.2	91427.1	19881.8	6492.6

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY03	2.9	42.9	9.3	3.0
FY04	2.0	29.8	6.5	2.1
FY05	2.1	30.4	6.6	2.2
FY06	3.1	45.7	9.9	3.2

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
9.3		42.9	3.0	2.9
6.5		29.8	2.1	2.0
6.6		30.4	2.2	2.1
9.9		45.7	3.2	3.1

**Annual Emissions (Alternative C)**

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY03	0.0	0.0	0.0	0.0
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	2754.4	40477.9	8802.4	2874.5

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY03	0.0	0.0	0.0	0.0
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	1.4	20.2	4.4	1.4

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
4.4		20.2	1.4	1.4

Predator EA - Emission Calculations  
**Grading (ISAFAF)**

**Emissions from Grading**

		Alternative			
		A	B	C	
Grading	Square Feet				
New facilities & structures		617,290	617,290	84,000	
Pavement		220,000	220,000	220,000	
<b>TOTAL GRADED AREA</b>	<b>Square Feet</b>	<b>4,000,000</b>	<b>4,000,000</b>	<b>1,452,304</b>	
<b>TOTAL GRADED AREA</b>	<b>Acres</b>	<b>91.83</b>	<b>91.83</b>	<b>33.34</b>	

Grading Emission Factor                      55 lb/acre/day

Number of days of ground disturbance from grading per acre                      3

Emissions PM10 (lb/day)                      15152              15152              5501  
Emissions PM10 (tons/day)                      7.6              7.6              2.8

Acres/day                      3  
Days of grading                      31

	Alternative		
	A	B	C
PM10 Emissions (tons)	231.9	231.9	84.2
PM10 Emissions (tons/year)	58.0	58.0	28.1

Predator EA - Emission Calculations  
**Construction Data (Nellis)**

**From: Table 2-4. Proposed Beddown Projects**

		<i>Alternatives A and B</i>		<i>Alternative C</i>	
		<i>Increased Area (sq ft)</i>	<i>Timing</i>	<i>Increased Area (sq ft)</i>	<i>Timing</i>
	Munitions Storage Structures				
	[3 at Nellis AFB)	7,200	FY06		

Grand Total	7,200 sq ft	0 sq ft
FY03	0 sq ft	0 sq ft
FY04	0 sq ft	0 sq ft
FY05	0 sq ft	0 sq ft
FY06	7200 sq ft	0 sq ft

Predator EA - Emission Calculations  
**Bldg Const- Alt A,B&C (Nellis)**

**Emission Factors**

Land Use	Unit of Measure	Emission Factors (lbs/construction per			
		ROC	NOx	CO	PM10
General Industrial	1000 ft2 GFA	32.79	481.88	104.79	34.22

**Construction Data**

Fiscal Year	Alternatives A and B		Alternative C	
	Increased Area		Increased Area	
FY04	0	sq ft	0	sq ft
FY05	0	sq ft	0	sq ft
FY06	7200	sq ft	0	sq ft

**Annual Emissions (Alternatives A and B)**

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	236.1	3469.5	754.5	246.4

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	0.1	1.7	0.4	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
0.4		1.7	0.1	0.1

**Annual Emissions (Alternative C)**

Fiscal Year	Emissions (lbs/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	0.0	0.0	0.0	0.0

Fiscal Year	Emissions (tons/year)			
	ROC	NOx	CO	PM10
FY04	0.0	0.0	0.0	0.0
FY05	0.0	0.0	0.0	0.0
FY06	0.0	0.0	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0
0.0		0.0	0.0	0.0

Predator EA - Emission Calculations  
**Grading (Nellis)**

**Emissions from Grading**

		Alternative			
		A	B	C	
Grading	Square Feet				
New facilities		7,200	7,200	0	
New Pavement					
<b>TOTAL GRADED AREA</b>	<b>Square Feet</b>	<b>34,397</b>	<b>34,397</b>	<b>0</b>	
<b>TOTAL GRADED AREA</b>	<b>Acres</b>	<b>0.79</b>	<b>0.79</b>	<b>0.00</b>	

Grading Emission Factor                      55 lb/acre/day

Number of days of ground disturbance from grading per acre                      3

Emissions PM10 (lb/day)                      130              130              0  
Emissions PM10 (tons/day)                      0.1              0.1              0.0

Acres/day                      3  
Days of grading                      0.3

	Alternative		
	A	B	C
Emissions (tons/year)	0.017	0.017	0.000

**Predator EA - Emission Calculations**  
**ISAFAF Commuting(POV)-Alt A**

**POV Emission Factors**  
 (from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

**POV Commuting Data**

Commuting Distance = 90 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 1.1 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership  
 Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	101	0.25

Average model year (baseline) = 1995  
 Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
 #miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	25	23	495,818	11.3	1.5	0.9	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
11.3	0.0	0.9	0.0	1.5

**Predator EA - Emission Calculations  
ISAFAF Commuting(POV)-Alt B**

**POV Emission Factors**  
(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

**POV Commuting Data**

Commuting Distance = 90 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 1.1 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership  
 Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	143	0.25

Average model year (baseline) = 1995  
 Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
 #miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	36	33	702,000	15.9	2.2	1.3	0.0	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
15.9	0.0	1.3	0.1	2.2

**Predator EA - Emission Calculations  
ISAFAF Commuting(POV)-Alt C**

**POV Emission Factors**  
(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

**POV Commuting Data**

Commuting Distance = 90 miles/RT  
Weekly schedule = 5 days/week  
Annual schedule = 48 weeks/year  
AVR = 1.1 commuters/RT  
% of Employees Living On-Base - %

AVR=Average vehicle ridership  
Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	(560)	0.25

Average model year (baseline) = 1995  
Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
#miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	(140)	(127)	(2,749,091)	-62.4	-8.5	-5.1	0.0	-0.2

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
-62.4	0.0	-5.1	-0.2	-8.5

**Predator EA - Emission Calculations  
ISAFAF Commuting(POV2Bus)-Alt A**

**POV Emission Factors**  
(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

**POV Commuting Data**

Commuting Distance = 12 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 1.1 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership  
 Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	101	0.75

Average model year (baseline) = 1995  
 Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
 #miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	76	69	198,327	4.5	0.6	0.4	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
4.5	0.0	0.4	0.0	0.6

**Predator EA - Emission Calculations  
ISAFAF Commuting(POV2Bus)-Alt B**

**POV Emission Factors**  
(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

**POV Commuting Data**

Commuting Distance = 12 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 1.1 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership  
 Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	143	0.75

Average model year (baseline) = 1995  
 Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
 #miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	107	98	280,800	6.4	0.9	0.5	0.0	0.0

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
6.4	0.0	0.5	0.0	0.9

**Predator EA - Emission Calculations  
ISAFAF Commuting(POV2Bus)-Alt C**

**POV Emission Factors**  
(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	33.850	4.080	2.160	0.005	0.082
POV	1995	20.600	2.820	1.670	0.005	0.078

(Low Altitude <= 4,000 feet)

	Calendar Year	CO (g/mi)	VOC (g/mi)	NOx (g/mi)	SOx (g/mi)	PM (g/mi)
POV	1990	24.520	3.410	2.300	0.005	0.082
POV	1995	16.580	2.470	1.640	0.005	0.078

**POV Commuting Data**

Commuting Distance = 12 miles/RT  
Weekly schedule = 5 days/week  
Annual schedule = 48 weeks/year  
AVR = 1.1 commuters/RT  
% of Employees Living On-Base - %

AVR=Average vehicle ridership  
Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	(560)	0.75

Average model year (baseline) = 1995  
Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
#miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons)	VOC (tons)	NOx (tons)	SOx (tons)	PM (tons)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	(420)	(382)	(1,099,636)	-25.0	-3.4	-2.0	0.0	-0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
-25.0	0.0	-2.0	-0.1	-3.4

**Predator EA - Emission Calculations**  
**ISAFAF Commuting(Bus)-Alt A**

**POV Emission Factors**  
 (from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
HDDV	1990	20.260	5.600	18.530	0.088	1.652
HDDV	1995	18.690	4.910	10.810	0.088	1.652

(Low Altitude <= 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
HDDV	1990	12.290	2.510	18.530	0.088	1.652
HDDV	1995	11.220	2.160	10.810	0.088	1.652

**POV Commuting Data**

Commuting Distance = 90 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 50 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership  
 Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	101	0.75

Average model year (baseline) = 1995  
 Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
 #miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons/yr)	VOC (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	76	2	32,724	0.7	0.2	0.4	0.0	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.7	0.0	0.4	0.1	0.2

**Predator EA - Emission Calculations**  
**ISAFAF Commuting(Bus)-Alt B**

**POV Emission Factors**

(from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
HDDV	1990	20.260	5.600	18.530	0.088	1.652
HDDV	1995	18.690	4.910	10.810	0.088	1.652

(Low Altitude <= 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
HDDV	1990	12.290	2.510	18.530	0.088	1.652
HDDV	1995	11.220	2.160	10.810	0.088	1.652

**POV Commuting Data**

Commuting Distance = 90 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 50 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership

Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	143	0.75

Average model year (baseline) =

1995

Average model year (proposed) =

1995

#RT/day = #empl/day\*(%commuters/100)/AVR

#miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons/yr)	VOC (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	107	2	46,332	1.0	0.3	0.6	0.0	0.1

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
1.0	0.0	0.6	0.1	0.3

**Predator EA - Emission Calculations**  
**ISAFAF Commuting(Bus)-Alt C**

**POV Emission Factors**  
 (from Jagelski & O'Brien, 1994)

(High Altitude > 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
HDDV	1990	20.260	5.600	18.530	0.088	1.652
HDDV	1995	18.690	4.910	10.810	0.088	1.652

(Low Altitude <= 4,000 feet)

	Calendar	CO	VOC	NOx	SOx	PM
	Year	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)
HDDV	1990	12.290	2.510	18.530	0.088	1.652
HDDV	1995	11.220	2.160	10.810	0.088	1.652

**POV Commuting Data**

Commuting Distance = 90 miles/RT  
 Weekly schedule = 5 days/week  
 Annual schedule = 48 weeks/year  
 AVR = 50 commuters/RT  
 % of Employees Living On-Base - %

AVR=Average vehicle ridership  
 Assume on-base workers do not commute.

Commuters	Total	Fraction using POVs
Baseline		
Proposed	(560)	0.75

Average model year (baseline) = 1995  
 Average model year (proposed) = 1995

#RT/day = #empl/day\*(%commuters/100)/AVR  
 #miles/yr = #miles/RT \* RT/wk \* wk/yr

**Emission Calculation**

	Commuters	Daily Trips (RT/day)	Annual Miles (miles)	CO (tons/yr)	VOC (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)
Baseline	-	-	-	0.0	0.0	0.0	0.0	0.0
Proposed	(420)	(8)	(181,440)	-3.7	-1.0	-2.2	0.0	-0.3

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
-3.7	0.0	-2.2	-0.3	-1.0

Predator EA - Emission Calculations  
**Emission Factors- Predator**

						Aircraft Emissions - Sorties (Intermediate Mode)					
						(lb/hr)					
Aircraft	Similar Aircraft	Engine	No. Eng.	Engine Reference	EF Reference	Fuel	CO	VOC	NOx	SOx	PM
RQ-1	RQ-1	O-320	1	Similar engine to Rodax 914	EPA (1992), p. 162	66.60	65.90	0.82	0.26	0.01	0.07
MQ-1	MQ-1	O-320	1	Similar engine to Rodax 914	EPA (1992), p. 162	66.60	65.90	0.82	0.26	0.01	0.07
MQ-9	MQ-9	PT6A-27	1	Small turboprop engine	EPA (1992), p. 167	400.20	0.48	0.00	2.80	0.22	0.40

Aircraft Emissions - LTOs					
(lb/LTO)					
Fuel	CO	VOC	NOx	SOx	PM
15.35	17.21	0.28	0.02	0.00	0.02
15.35	17.21	0.28	0.02	0.00	0.02
91.00	2.50	1.59	0.56	0.05	0.09

Aircraft Emissions - TGOs					
(lb/TGO)					
Fuel	CO	VOC	NOx	SOx	PM
12.79	14.46	0.19	0.02	0.00	0.01
12.79	14.46	0.19	0.02	0.00	0.01
60.28	0.53	0.05	0.48	0.03	0.06

Notes:

Lycoming O-320 engine is used on Piper PA-18 aircraft (small prop)

DeHaviland PT-6A-27 engine is used on the UV-18A aircraft (small turbo-prop)

Intermediate Mode = 80% power

Predator EA - Emission Calculations  
**Flying Operations- Predator**

Calculations are based on sorties

One Sortie includes:

- \* One LTO at ISAFAP
- \* Five TGO's at ISAFAP
- \* Flight time to restricted airspace (not included).
- \* Flight time in restricted airspace.

Restricted Airspace	Flight time (hrs)
R-4806W (Indian Springs)	4.5
R-2805 (Edwards)	4

**Data from Table 2-1**

Aircraft	Aircraft Mix			
	Existing	Alt A	Alt B	Alt C
RQ-1/MQ-1	40	68	68	28
MQ-9	0	8	20	20
<b>Total</b>	<b>40</b>	<b>76</b>	<b>88</b>	<b>48</b>

Aircraft	Aircraft Percentages			
	Existing	Alt A	Alt B	Alt C
RQ-1/MQ-1	100%	89%	77%	58%
MQ-9	0%	11%	23%	42%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Data from Table 2-4:**

Restricted Airspace	Sorties to Restricted Airspaces			
	Existing	Alt A	Alt B	Alt C
R-4806W (Indian Springs)	1080	2,988	3,720	1,300
R-2508 (Edwards)	174	960	960	210
<b>Total Sorties</b>	<b>1254</b>	<b>3948</b>	<b>4680</b>	<b>1510</b>

Difference from Existing Conditions:

Restricted Airspace		Alt A	Alt B	Alt C
R-4806W (Indian Springs)		1,908	2,640	220
R-2508 (Edwards)		786	786	36
<b>Total Sorties</b>	<b>0</b>	<b>2694</b>	<b>3426</b>	<b>256</b>

Predator EA - Emission Calculations  
Aircraft Emissions RQ-1, MQ-1

Emission Factors for RQ-1/MQ-1:

Operation	CO	VOC	NOx	SOx	PM
LTO (lb/LTO)	17.21	0.28	0.02	0.00	0.02
TGO (lb/TGO)	14.46	0.19	0.02	0.00	0.01
Intermediate Power (lb/hr)	65.90	0.82	0.26	0.01	0.07

Sorties (all aircraft types):

Restricted Airspace	Sorties to Restricted Airspaces			
	Existing	Alt A	Alt B	Alt C
R-4806W (Indian Springs)	1080	2,988	3,720	1,300
R-2508 (Edwards)	174	960	960	210
<b>Total Sorties</b>	<b>1254</b>	<b>3948</b>	<b>4680</b>	<b>1510</b>

Aircraft Type	Percentage of Aircraft Type			
	Existing	Alt A	Alt B	Alt C
RQ-1/MQ-1	100%	89%	77%	58%

Sortie Components	
LTO (# per sortie)	1
TGO (# per sortie)	5
Time in Restricted Airspace	4.5 R-4806W (Indian Springs)
Time in Restricted Airspace	4 R-2508 (Edwards)

Existing Operations	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	10.8	0.2	0.0	0.0	0.0
TGO	45.3	0.6	0.1	0.0	0.0
R-4806W (Indian Springs)	160.1	2.0	0.6	0.0	0.2
R-2508 (Edwards)	22.9	0.3	0.1	0.0	0.0

Alternative A	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	30.4	0.5	0.0	0.0	0.0
TGO	127.7	1.6	0.2	0.0	0.1
R-4806W (Indian Springs)	396.4	5.0	1.6	0.0	0.4
R-2508 (Edwards)	113.2	1.4	0.5	0.0	0.1

Alternative B	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	31.1	0.5	0.0	0.0	0.0
TGO	130.7	1.7	0.2	0.0	0.1
R-4806W (Indian Springs)	426.2	5.3	1.7	0.0	0.4
R-2508 (Edwards)	97.8	1.2	0.4	0.0	0.1

Alternative C	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	7.6	0.1	0.0	0.0	0.0
TGO	31.8	0.4	0.0	0.0	0.0
R-4806W (Indian Springs)	112.4	1.4	0.5	0.0	0.1
R-2508 (Edwards)	16.1	0.2	0.1	0.0	0.0

LTO

$$E = (\text{Total Sorties}) * (\text{LTO/sortie}) * (\text{EF, LTO}) * (\% \text{Aircraft}) / 2000$$

TGO

$$E = (\text{Total Sorties}) * (\text{TGO/sortie}) * (\text{EF, TGO}) * (\% \text{Aircraft}) / 2000$$

RA Activities

$$E = (\text{Sorties/RA}) * (\text{Time, hr}) * (\text{EF, IntPwr}) * (\% \text{Aircraft}) / 2000$$

Existing Operations	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAF AF	56.1	0.0	0.1	0.0	0.8
R-4806W	160.1	0.0	0.6	0.2	2.0
R-2508	22.9	0.0	0.1	0.0	0.3

ISAF AF

R-4806W

R-2508

Alternative A	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAF AF	158.1	0.0	0.2	0.1	2.1
R-4806W	396.4	0.0	1.6	0.4	5.0
R-2508	113.2	0.0	0.5	0.1	1.4

ISAF AF

R-4806W

R-2508

Alternative B	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAF AF	161.8	0.0	0.2	0.1	2.2
R-4806W	426.2	0.0	1.7	0.4	5.3
R-2508	97.8	0.0	0.4	0.1	1.2

ISAF AF

R-4806W

R-2508

Alternative C	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAF AF	39.4	0.0	0.1	0.0	0.5
R-4806W	112.4	0.0	0.5	0.1	1.4
R-2508	16.1	0.0	0.1	0.0	0.2

ISAF AF

R-4806W

R-2508

Alternative A	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	101.9	0.0	0.2	0.1	1.4
	236.3	0.0	0.9	0.2	3.0
	90.3	0.0	0.4	0.1	1.1

Alternative B	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	105.7	0.0	0.2	0.1	1.4
	266.1	0.0	1.1	0.3	3.3
	74.8	0.0	0.3	0.1	0.9

Alternative C	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	-16.7	0.0	0.0	0.0	-0.2
	-47.7	0.0	-0.2	0.0	-0.6
	-6.8	0.0	0.0	0.0	-0.1

Predator EA - Emission Calculations  
Aircraft Emissions MQ-9

Emission Factors for MQ-9

Operation	CO	VOC	NOx	SOx	PM
LTO (lb/LTO)	2.50	1.59	0.56	0.05	0.09
TGO (lb/TGO)	0.53	0.05	0.48	0.03	0.06
Intermediate Power (lb/hr)	0.48	0.00	2.80	0.22	0.40

Sorties (all aircraft types):

Restricted Airspace	Sorties to Restricted Airspaces			
	Existing	Alt A	Alt B	Alt C
R-4806W (Indian Springs)	1080	2,988	3,720	1,300
R-2508 (Edwards)	174	960	960	210
<b>Total Sorties</b>	<b>1254</b>	<b>3948</b>	<b>4680</b>	<b>1510</b>

Aircraft Type	Percentage of Aircraft Type			
	Existing	Alt A	Alt B	Alt C
MQ-9	0%	11%	23%	42%

Sortie Components	
LTO (# per sortie)	1
TGO (# per sortie)	5
Time in Restricted Airspace	4.5 R-4806W (Indian Springs)
Time in Restricted Airspace	4 R-2508 (Edwards)

Existing Operations	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	0.0	0.0	0.0	0.0	0.0
TGO	0.0	0.0	0.0	0.0	0.0
R-4806W (Indian Springs)	0.0	0.0	0.0	0.0	0.0
R-2508 (Edwards)	0.0	0.0	0.0	0.0	0.0

Alternative A	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	0.5	0.3	0.1	0.0	0.0
TGO	0.6	0.0	0.5	0.0	0.1
R-4806W (Indian Springs)	0.3	0.0	2.0	0.2	0.3
R-2508 (Edwards)	0.1	0.0	0.6	0.0	0.1

Alternative B	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	1.3	0.8	0.3	0.0	0.0
TGO	1.4	0.1	1.3	0.1	0.2
R-4806W (Indian Springs)	0.9	0.0	5.3	0.4	0.8
R-2508 (Edwards)	0.2	0.0	1.2	0.1	0.2

Alternative C	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	0.8	0.5	0.2	0.0	0.0
TGO	0.8	0.1	0.8	0.1	0.1
R-4806W (Indian Springs)	0.6	0.0	3.4	0.3	0.5
R-2508 (Edwards)	0.1	0.0	0.5	0.0	0.1

LTO

$$E = (\text{Total Sorties}) * (\text{LTO/sortie}) * (\text{EF, LTO}) * (\% \text{Aircraft}) / 2000$$

TGO

$$E = (\text{Total Sorties}) * (\text{TGO/sortie}) * (\text{EF, TGO}) * (\% \text{Aircraft}) / 2000$$

RA Activities

$$E = (\text{Sorties/RA}) * (\text{Time, hr}) * (\text{EF, IntPwr}) * (\% \text{Aircraft}) / 2000$$

	Existing Operations				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	0.0	0.0	0.0	0.0	0.0
R-4806W	0.0	0.0	0.0	0.0	0.0
R-2508	0.0	0.0	0.0	0.0	0.0

	Alternative A				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	1.1	0.0	0.6	0.1	0.4
R-4806W	0.3	0.2	2.0	0.3	0.0
R-2508	0.1	0.0	0.6	0.1	0.0

	Alternative B				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	2.7	0.1	1.6	0.2	1.0
R-4806W	0.9	0.4	5.3	0.8	0.0
R-2508	0.2	0.1	1.2	0.2	0.0

	Alternative C				
	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	1.6	0.1	0.9	0.1	0.6
R-4806W	0.6	0.3	3.4	0.5	0.0
R-2508	0.1	0.0	0.5	0.1	0.0

Alternative A					
Increased Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
1.1	0.0	0.6	0.1	0.4	
0.3	0.2	2.0	0.3	0.0	
0.1	0.0	0.6	0.1	0.0	

Alternative B					
Increased Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
2.7	0.1	1.6	0.2	1.0	
0.9	0.4	5.3	0.8	0.0	
0.2	0.1	1.2	0.2	0.0	

Alternative C					
Increased Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
1.6	0.1	0.9	0.1	0.6	
0.6	0.3	3.4	0.5	0.0	
0.1	0.0	0.5	0.1	0.0	

Predator EA - Emission Calculations  
Aircraft Emission Totals

Existing Operations	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	10.8	0.2	0.0	0.0	0.0
TGO	45.3	0.6	0.1	0.0	0.0
R-4806W (Indian Springs)	160.1	2.0	0.6	0.0	0.2
R-2508 (Edwards)	22.9	0.3	0.1	0.0	0.0

Alternative A	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	30.9	0.8	0.2	0.0	0.0
TGO	128.2	1.7	0.7	0.0	0.2
R-4806W (Indian Springs)	396.8	5.0	3.6	0.2	0.7
R-2508 (Edwards)	113.3	1.4	1.0	0.1	0.2

Alternative B	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	32.5	1.4	0.3	0.0	0.1
TGO	132.1	1.8	1.5	0.1	0.3
R-4806W (Indian Springs)	427.1	5.3	7.0	0.5	1.2
R-2508 (Edwards)	98.0	1.2	1.6	0.1	0.3

Alternative C	Emissions (tons/year)				
	CO	VOC	NOx	SOx	PM
LTO	8.4	0.6	0.2	0.0	0.0
TGO	32.7	0.5	0.8	0.1	0.1
R-4806W (Indian Springs)	113.0	1.4	3.9	0.3	0.6
R-2508 (Edwards)	16.2	0.2	0.6	0.0	0.1

Existing Operations	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	56.1	0.01	0.1	0.05	0.8
R-4806W	160.1	0.02	0.6	0.2	2.0
R-2508	22.9	0.003	0.1	0.02	0.3

Alternative A	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	159.1	0.1	0.9	0.2	2.5
R-4806W	396.8	0.2	3.6	0.7	5.0
R-2508	113.3	0.1	1.0	0.2	1.4

Alternative B	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	164.6	0.1	1.8	0.4	3.2
R-4806W	427.1	0.5	7.0	1.2	5.3
R-2508	98.0	0.1	1.6	0.3	1.2

Alternative C	Total Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
ISAFAP	41.0	0.1	1.0	0.2	1.1
R-4806W	113.0	0.3	3.9	0.6	1.4
R-2508	16.2	0.04	0.6	0.1	0.2

Alternative A	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	103.0	0.1	0.8	0.2	1.8
	236.6	0.2	2.9	0.5	3.0
	90.4	0.1	0.9	0.2	1.1

Alternative B	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	108.4	0.1	1.7	0.3	2.4
	267.0	0.4	6.4	1.0	3.3
	75.0	0.1	1.5	0.3	0.9

Alternative C	Increased Emissions (tons/year)				
	CO	SOx	NOx	PM	VOC
	-15.1	0.1	0.9	0.1	0.3
	-47.1	0.3	3.2	0.4	-0.6
	-6.7	0.04	0.5	0.1	-0.1

Predator EA - Emission Calculations  
**GSE Emissions**

**GSE Emissions**

**Alternative A**

2694 sorties/year      Generator Time = 8 (hrs/sortie)  
 Generator Size = 40 (kW)

Pollutant	Emissions per kW-hr (g/kW-hr)	No. of hrs/year	Total per Year (tons/year/generator)	No. of Generators	Total/year (tons/yr)
PM10	1.34	21552	1.27	2	2.5
SOx	1.25	21552	1.19	2	2.4
CO	4.06	21552	3.86	2	7.7
HC	1.5	21552	1.43	2	2.9
NOx	18.8	21552	17.86	2	35.7

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
7.7	2.4	35.7	2.5	2.9

**Alternative B**

3426 sorties/year      Generator Time = 8 (hrs/sortie)  
 Generator Size = 40 (kW)

Pollutant	Emissions per kW-hr (g/kW-hr)	No. of hrs/year	Total per Year (tons/year/generator)	No. of Generators	Total/year (tons/yr)
PM10	1.34	27408	1.62	2	3.2
SOx	1.25	27408	1.51	2	3.0
CO	4.06	27408	4.91	2	9.8
HC	1.5	27408	1.81	2	3.6
NOx	18.8	27408	22.72	2	45.4

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
9.8	3.0	45.4	3.2	3.6

**Alternative C**

256 sorties/year      Generator Time = 8 (hrs/sortie)  
 Generator Size = 40 (kW)

Pollutant	Emissions per kW-hr (g/kW-hr)	No. of hrs/year	Total per Year (tons/year/generator)	No. of Generators	Total/year (tons/yr)
PM10	1.34	2048	0.12	2	0.2
SOx	1.25	2048	0.11	2	0.2
CO	4.06	2048	0.37	2	0.7
HC	1.5	2048	0.14	2	0.3
NOx	18.8	2048	1.70	2	3.4

Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.7	0.2	3.4	0.2	0.3

## Predator EA - Emission Calculations

### Emission Factors - Vehicles

#### Fleet Emission Factors

Jagielski, K. and O'Brien, J. 1994. *Calculations Methods for Criteria Air Pollution Emission Inventories*, USAF, Armstrong Laboratory, AL/OE-TR-1994-0049. Brooks AFB.

See below for sulfur calculations, which are based on %S in fuel, etc.

1990 Average model year.

High Altitude >4,000 ft.

Vehicle	CO	VOC	NOx	SOx	PM	Reference	
Type	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(from Jagelski & O'Brien, 1994)	
POV	33.85	4.08	2.16	0.005	0.082	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	27.27	1.9	1.5	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	39.34	2.76	1.84	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	93.95	4.03	4.01	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	2.07	0.78	1.45	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	3.25	1.03	1.53	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	20.26	5.6	18.53	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

1995 Average model year.

High Altitude >4,000 ft.

Vehicle	CO	VOC	NOx	SOx	PM	Reference	
Type	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(from Jagelski & O'Brien, 1994)	
POV	20.6	2.82	1.67	0.005	0.078	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	15.58	1.17	1.29	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	23.87	1.8	1.58	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	60.63	2.94	3.86	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	1.52	0.5	1.12	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	2.61	0.73	1.21	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	18.69	4.91	10.81	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

1990 Average model year.

Low Altitude <=4,000 ft.

Vehicle	CO	VOC	NOx	SOx	PM	Reference	
Type	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(from Jagelski & O'Brien, 1994)	
POV	24.52	3.41	2.3	0.005	0.082	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	20.36	1.71	1.61	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	27.42	2.39	2.05	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	59.83	3.27	5.81	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	1.56	0.6	1.45	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	1.67	0.72	1.55	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	12.29	2.51	18.53	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

1995 Average model year.

Low Altitude <=4,000 ft.

Vehicle	CO	VOC	NOx	SOx	PM	Reference	
Type	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(from Jagelski & O'Brien, 1994)	
POV	16.58	2.47	1.64	0.005	0.078	(from Jagelski & O'Brien, 1994)	privately-owned vehicles
LDGV	13.2	1.12	1.22	0.005	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	18.49	1.63	1.63	0.007	0.022	(from Jagelski & O'Brien, 1994)	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	36.39	2.42	4.93	0.011	0.102	(from Jagelski & O'Brien, 1994)	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	1.4	0.47	1.12	0.038	0.2	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	1.52	0.6	1.21	0.053	0.26	(from Jagelski & O'Brien, 1994)	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	11.22	2.16	10.81	0.088	1.652	(from Jagelski & O'Brien, 1994)	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

#### SOx Emission Factors

S = sulfur content of fuel (S)	ppm	%	Fuel	Ref
	80	0.008	Gasoline	<a href="http://www.chevron.com/prodserv/fuels/bulletin/phase2rfg/char.shtml">http://www.chevron.com/prodserv/fuels/bulletin/phase2rfg/char.shtml</a>
	500	0.05	Diesel	<a href="http://www.chevron.com/prodserv/fuels/bulletin/diesel/L2_3_9_rf.htm">http://www.chevron.com/prodserv/fuels/bulletin/diesel/L2_3_9_rf.htm</a>

Typical Fuel Economy (X) MPG Diesel Gasol. [http://www1.faa.gov/arp/app600/ileavTechnical\\_Report.doc](http://www1.faa.gov/arp/app600/ileavTechnical_Report.doc)

Heavy Duty Trucks	6-8	6	HDDV	7.5	HDGV
Medium Duty Trucks	10-14	10	LDDT	12.5	LDGT
Light Duty Trucks/Cars	16-24	14	LDDV	17.5	LDGV

#### Density of fuel (D)

Diesel	7	lb/gal
Gasoline	7	lb/gal

#### Emission Factor for SO2

EF (g/mi) = (1 gal fuel/X miles) \* (D lb fuel/1 gal fuel) \* (453.6 g/lb) \* (S g sulfur/1,000,000 g fuel) \* (64.06 g SO2/32.06 g S)

	SOx	
	(g/mi)	
POV	0.0048	privately-owned vehicles
LDGV	0.0048	light-duty gasoline-fueled vehicles designed to transport 12 people or fewer
LDGT	0.0068	light-duty gasoline-fueled trucks with GVW <= 8,500 lbs
HDGV	0.0113	heavy-duty gasoline-fueled vehicles with GVW >8,500 lbs
LDDV	0.0378	light-duty diesel-powered vehicles designed to transport 12 people or fewer
LDDT	0.053	light-duty diesel-powered trucks with GVW <= 8,500 lbs
HDDV	0.0883	heavy-duty diesel-powered vehicles with GVW > 8,500 lbs

Predator EA - Emission Calculations  
**Emission Factors - Heavy Equip**

Table A9-8-A															
Emissions, lb = (# equip) * (hours/period) * (EF, lb/hr)															
Table A9-8-B							Table A9-8-C		A9-8-D						
Emissions = (# equip) * (hours/period) * (HP) * (EF, lb/HP-hr) * (load factor)															
Emission Factor (lb/HP-hour)															
Equipment	CO	ROC	NOx	SOx	PM10	HP	Gal		% Load		CO	ROC	NOx	SOx	PM10
Fork Lift, 50 HP - Gasoline											14	0.5	0.018	x	0.003
Fork Lift, 50 HP - Diesel											0.18	0.053	0.441	x	0.031
Fork Lift, 175 HP - Gasoline											43.97	1.53	0.92	x	0.123
Fork Lift, 175 HP - Diesel											0.52	0.17	1.54	x	0.093
Trucks, Off-Highway - Gasoline											x	x	x	x	x
Trucks, Off-Highway - Diesel											1.8	0.19	4.17	0.45	0.26
Tracked Loader - Gasoline											x	x	x	x	x
Tracked Loader - Diesel											0.201	0.095	0.83	0.076	0.059
Tracked Tractor - Gasoline											x	x	x	x	x
Tracked Tractor - Diesel											0.35	0.12	1.26	0.14	0.112
Scraper - Gasoline											x	x	x	x	x
Scraper - Diesel											1.25	0.27	3.84	0.46	0.41
Wheeled Dozer - Gasoline											x	x	x	x	x
Wheeled Dozer - Diesel											x	x	x	0.35	0.165
Wheeled Loader - Gasoline											15.57	0.515	0.518	0.023	0.03
Wheeled Loader - Diesel											0.572	0.23	1.9	0.182	0.17
Wheeled Tractor - Gasoline											9.53	0.351	0.43	0.015	0.024
Wheeled Tractor - Diesel											3.58	0.18	1.27	0.09	0.14
Roller - Gasoline											13.41	0.59	0.362	0.019	0.026
Roller - Diesel											0.3	0.065	0.87	0.067	0.05
Motor Grader - Gasoline											12.1	0.4	0.32	0.017	0.021
Motor Grader - Diesel											0.151	0.039	0.713	0.086	0.061
Miscellaneous - Gasoline											17.02	0.543	0.412	0.023	0.026
Miscellaneous - Diesel											0.675	0.15	1.7	0.143	0.14
Chainsaws > 4 HP (2-stroke) - Gasoline	2.150	0.684	0.002	0.001	0.001	6	2		50		6.450	2.052	0.006	0.002	0.004
Asphalt Paver - Diesel	0.007	0.001	0.023	0.002	0.001	91	46		59		0.376	0.054	1.235	0.107	0.054
Crane - Diesel	0.009	0.003	0.023	0.002	0.002	195	97		43		0.755	0.252	1.929	0.168	0.126
Concrete Paver -Diesel	0.010	0.002	0.022	0.002	0.001	130	66		62		0.806	0.161	1.773	0.161	0.081
Trctr/Lodr/Bckho - Diesel	0.015	0.003	0.022	0.002	0.001	79	21		46.5		0.551	0.110	0.808	0.073	0.037
Excavator - Diesel	0.011	0.001	0.024	0.002	0.001	152	95		58		0.968	0.088	2.112	0.176	0.088
Rubber Tired Dozers - Diesel	0.010	0.002	0.021	0.002	0.001	356	182		59		2.100	0.420	4.411	0.420	0.105
Bore/Drill Rig (4-strk) - Diesel	0.020	0.003	0.024	0.002	0.002	209	107		75		3.135	0.470	3.762	0.314	0.235
Fork Lifts - Diesel	0.013	0.003	0.031	0.002	0.002	83	42		30		0.324	0.075	0.772	0.050	0.037

Predator EA - Emission Calculations

**Paving**

	Alt A	Alt B	Alt C	
New Pavement (sq ft)	220,000	220,000	100,000	FY03
	70,000	70,000	70,000	FY05
			50,000	FY06

**Dump Truck to Import Paving Materials (FY03)**

Pavement depth (ft)	0.5	0.5	0.5	
Pavement volume (cu ft)	110000	110000	50000	
Pavement volume (cu yd)	12222	12222	5556	
Miles per round trip	90	90	90	Estimate
Size of truckload	10	10	10	Typical size of dump truck
Total trips	1222	1222	556	(gravel volume) / (volume/truck)
Total miles	110000	110000	50000	(trips) x (miles/trip)

		Emission Factor (g/mi)				
Vehicle Type		CO	VOC	NOx	SOx	PM
HDDV		20.26	5.60	18.53	0.09	1.65

**Pavement Hauling Emissions (FY03)**

		Emissions (tons/year)				
	Total Miles	CO	VOC	NOx	SOx	PM
Alternative A	110000	2.5	0.7	2.2	0.0	0.2
Alternative B	110000	2.5	0.7	2.2	0.0	0.2
Alternative C	50000	1.1	0.3	1.0	0.0	0.1

**Installation of New Asphalt (FY03)**

Paving Rate	5000 (sq ft/day)
Workday	8 (hr/day)

	Alt A	Alt B	Alt C
Days of paving activity	44	44	20
Hours of paving activity	352	352	160

		Emission Factor (lb/hour)				
Equipment		CO	ROC	NOx	SOx	PM10
Bulldozer		2.100	0.420	4.411	0.420	0.105
Asphalt Paver		0.376	0.054	1.235	0.107	0.054
Roller		0.300	0.065	0.870	0.067	0.050

			Emissions (tons/year)				
Alternative A			CO	ROC	NOx	SOx	PM10
Equipment	# Eq	Hours					
Bulldozer	1	352	0.4	0.1	0.8	0.1	0.0
Asphalt Paver	1	352	0.1	0.0	0.2	0.0	0.0
Roller	1	352	0.1	0.0	0.2	0.0	0.0

			Emissions (tons/year)				
Alternative B			CO	ROC	NOx	SOx	PM10
Equipment	# Eq	Hours					
Bulldozer	1	352	0.4	0.1	0.8	0.1	0.0
Asphalt Paver	1	352	0.1	0.0	0.2	0.0	0.0
Roller	1	352	0.1	0.0	0.2	0.0	0.0

			Emissions (tons/year)				
Alternative C			CO	ROC	NOx	SOx	PM10
Equipment	# Eq	Hours					
Bulldozer	1	160	0.2	0.0	0.4	0.0	0.0
Asphalt Paver	1	160	0.0	0.0	0.1	0.0	0.0
Roller	1	160	0.0	0.0	0.1	0.0	0.0

**Total Emissions - Paving Operation (FY03)**

		Emissions (tons/year)				
		CO	ROC	NOx	SOx	PM10
Alternative A		2.9	0.8	3.4	0.1	0.2
Alternative B		2.9	0.8	3.4	0.1	0.2
Alternative C		1.3	0.4	1.5	0.1	0.1

FY03 Emissions (tons/year)					
CO	SOx	NOx	PM	VOC	
2.9	0.1	3.4	0.2	0.8	
2.9	0.1	3.4	0.2	0.8	
1.3	0.1	1.5	0.1	0.4	

**Dump Truck to Import Paving Materials (FY05)**

Pavement depth (ft)	0.5	0.5	0.5	
Pavement volume (cu ft)	35000	35000	35000	
Pavement volume (cu yd)	3889	3889	3889	
Miles per round trip	90	90	90	Estimate
Size of truckload	10	10	10	Typical size of dump truck
Total trips	389	389	389	(gravel volume) / (volume/truck)
Total miles	35000	35000	35000	(trips) x (miles/trip)

Predator EA - Emission Calculations  
**Paving**

Vehicle Type		Emission Factor (g/mi)				
		CO	VOC	NOx	SOx	PM
HDDV		20.26	5.60	18.53	0.09	1.65

Pavement Hauling Emissions (FY05)		Emissions (tons/year)				
Total Miles		CO	VOC	NOx	SOx	PM
Alternative A	35000	0.8	0.2	0.7	0.0	0.1
Alternative B	35000	0.8	0.2	0.7	0.0	0.1
Alternative C	35000	0.8	0.2	0.7	0.0	0.1

**Installation of New Asphalt (FY05)**

Paving Rate 5000 (sq ft/day)  
Workday 8 (hr/day)

	Alt A	Alt B	Alt C
Days of paving activity	14	14	14
Hours of paving activity	112	112	112

Equipment		Emission Factor (lb/hour)				
		CO	ROC	NOx	SOx	PM10
Bulldozer		2.100	0.420	4.411	0.420	0.105
Asphalt Paver		0.376	0.054	1.235	0.107	0.054
Roller		0.300	0.065	0.870	0.067	0.050

Alternative A		Emissions (tons/year)					
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	112	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	112	0.0	0.0	0.1	0.0	0.0
Roller	1	112	0.0	0.0	0.0	0.0	0.0

Alternative B		Emissions (tons/year)					
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	112	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	112	0.0	0.0	0.1	0.0	0.0
Roller	1	112	0.0	0.0	0.0	0.0	0.0

Alternative C		Emissions (tons/year)					
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	112	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	112	0.0	0.0	0.1	0.0	0.0
Roller	1	112	0.0	0.0	0.0	0.0	0.0

**Total Emissions - Paving Operation (FY05)**

	Emissions (tons/year)				
	CO	ROC	NOx	SOx	PM10
Alternative A	0.9	0.2	1.1	0.0	0.1
Alternative B	0.9	0.2	1.1	0.0	0.1
Alternative C	0.9	0.2	1.1	0.0	0.1

FY 05 Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.9	0.0	1.1	0.1	0.2
0.9	0.0	1.1	0.1	0.2
0.9	0.0	1.1	0.1	0.2

**Dump Truck to Import Paving Materials (FY06)**

Pavement depth (ft) 0.5 0.5 0.5  
Pavement volume (cu ft) 0 0 25000  
Pavement volume (cu yd) 0 0 2778  
Miles per round trip 90 90 90 Estimate  
Size of truckload 10 10 10 Typical size of dump truck  
Total trips 0 0 278 (gravel volume) / (volume/truck)  
Total miles 0 0 25000 (trips) x (miles/trip)

Vehicle Type		Emission Factor (g/mi)				
		CO	VOC	NOx	SOx	PM
HDDV		20.26	5.60	18.53	0.09	1.65

Pavement Hauling Emissions (FY06)		Emissions (tons/year)				
Total Miles		CO	VOC	NOx	SOx	PM
Alternative A	0	0.0	0.0	0.0	0.0	0.0
Alternative B	0	0.0	0.0	0.0	0.0	0.0
Alternative C	25000	0.6	0.2	0.5	0.0	0.0

Predator EA - Emission Calculations

**Paving**

**Installation of New Asphalt (FY06)**

Paving Rate 5000 (sq ft/day)  
Workday 8 (hr/day)

	Alt A	Alt B	Alt C
Days of paving activity	0	0	10
Hours of paving activity	0	0	80

Equipment	Emission Factor (lb/hour)				
	CO	ROC	NOx	SOx	PM10
Bulldozer	2.100	0.420	4.411	0.420	0.105
Asphalt Paver	0.376	0.054	1.235	0.107	0.054
Roller	0.300	0.065	0.870	0.067	0.050

Alternative A			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	0	0.0	0.0	0.0	0.0	0.0
Asphalt Paver	1	0	0.0	0.0	0.0	0.0	0.0
Roller	1	0	0.0	0.0	0.0	0.0	0.0

Alternative B			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	0	0.0	0.0	0.0	0.0	0.0
Asphalt Paver	1	0	0.0	0.0	0.0	0.0	0.0
Roller	1	0	0.0	0.0	0.0	0.0	0.0

Alternative C			Emissions (tons/year)				
Equipment	# Eq	Hours	CO	ROC	NOx	SOx	PM10
Bulldozer	1	80	0.1	0.0	0.2	0.0	0.0
Asphalt Paver	1	80	0.0	0.0	0.0	0.0	0.0
Roller	1	80	0.0	0.0	0.0	0.0	0.0

**Total Emissions - Paving Operation (FY06)**

	Emissions (tons/year)				
	CO	ROC	NOx	SOx	PM10
Alternative A	0.0	0.0	0.0	0.0	0.0
Alternative B	0.0	0.0	0.0	0.0	0.0
Alternative C	0.7	0.2	0.8	0.0	0.1

FY06 Emissions (tons/year)				
CO	SOx	NOx	PM	VOC
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.7	0.0	0.8	0.1	0.2

Predator EA - Emission Calculations  
**Emissions Summary (ISAFAP)**

**Emissions Summary**

Alternative A					
	Emissions (tons/year)				
Source	CO	SOx	NOx	PM	VOC
Construction (Infrastructure)	9.3	0.0	42.9	3.0	2.9
Grading				58.0	
Paving (Runway & Taxiway)	2.9	0.1	3.4	0.24	0.8
<b>Total Construction (FY03)</b>	<b>12.3</b>	<b>0.1</b>	<b>46.3</b>	<b>61.3</b>	<b>3.7</b>
Construction (Infrastructure)	6.5	0.0	29.8	2.1	2.0
Grading				58.0	
Paving (Runway & Taxiway)					
<b>Total Construction (FY04)</b>	<b>6.5</b>	<b>0.0</b>	<b>29.8</b>	<b>60.1</b>	<b>2.0</b>
Construction (Infrastructure)	6.6	0.0	30.4	2.2	2.1
Grading				58.0	
Paving (Runway & Taxiway)	0.9	0.0	1.1	0.1	0.2
<b>Total Construction (FY05)</b>	<b>7.5</b>	<b>0.0</b>	<b>31.4</b>	<b>60.2</b>	<b>2.3</b>
Construction (Infrastructure)	9.9	0.0	45.7	3.2	3.1
Grading				58.0	
Paving (Runway & Taxiway)	0.0	0.0	0.0	0.0	0.0
<b>Total Construction (FY06)</b>	<b>9.9</b>	<b>0.0</b>	<b>45.7</b>	<b>61.2</b>	<b>3.1</b>
Commuting POV (only)	11.3	0.003	0.9	0.04	1.5
Commuting POV-to-Bus	4.5	0.001	0.4	0.02	0.6
Commuting Busses	0.7	0.003	0.4	0.06	0.2
Aircraft (TGO+LTO)	103.0	0.1	0.8	0.2	1.8
Ground Support Equipment	7.7	2.4	35.7	2.5	2.9
<b>Total Operation</b>	<b>127.2</b>	<b>2.4</b>	<b>38.2</b>	<b>2.8</b>	<b>6.9</b>
Aircraft (R-4806W)	236.6	0.2	2.9	0.5	3.0

Predator EA - Emission Calculations  
**Emissions Summary (ISAFAP)**

Alternative B					
	Emissions (tons/year)				
Source	CO	SOx	NOx	PM	VOC
Construction (Infrastructure)	9.3	0.0	42.9	3.0	2.9
Grading				58.0	
Paving (Runway & Taxiway)	2.9	0.1	3.4	0.24	0.8
Total Construction (FY03)	12.3	0.1	46.3	61.3	3.7
Construction (Infrastructure)	6.5	0.0	29.8	2.1	2.0
Grading				58.0	
Paving (Runway & Taxiway)					
Total Construction (FY04)	6.5	0.0	29.8	60.1	2.0
Construction (Infrastructure)	6.6	0.0	30.4	2.2	2.1
Grading				58.0	
Paving (Runway & Taxiway)	0.9	0.0	1.1	0.1	0.2
Total Construction (FY05)	7.5	0.0	31.4	60.2	2.3
Construction (Infrastructure)	9.9	0.0	45.7	3.2	3.1
Grading				58.0	
Paving (Runway & Taxiway)	0.0	0.0	0.0	0.0	0.0
Total Construction (FY06)	9.9	0.0	45.7	61.2	3.1
Commuting POV (only)	15.9	0.004	1.3	0.1	2.2
Commuting POV-to-Bus	6.4	0.001	0.5	0.0	0.9
Commuting Busses	1.0	0.005	0.6	0.1	0.3
Aircraft (TGO+LTO)	108.4	0.1	1.7	0.3	2.4
Ground Support Equipment	9.8	3.0	45.4	3.2	3.6
Total Operation	141.5	3.2	49.5	3.7	9.3
Aircraft (R-4806W)	267.0	0.4	6.4	1.0	3.3

Predator EA - Emission Calculations  
Emissions Summary (ISAFAP)

Alternative C					
	Emissions (tons/year)				
Source	CO	SOx	NOx	PM	VOC
Construction (Infrastructure)	0.0	0.0	0.0	0.0	0.0
Grading				28.1	
Paving (Runway & Taxiway)	1.3	0.1	1.5	0.11	0.35
<b>Total Construction (FY03)</b>	<b>1.3</b>	<b>0.1</b>	<b>1.5</b>	<b>28.2</b>	<b>0.4</b>
Construction (Infrastructure)	0.0	0.0	0.0	0.0	0.0
Grading					
Paving (Runway & Taxiway)					
<b>Total Construction (FY04)</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Construction (Infrastructure)	0.0	0.0	0.0	0.0	0.0
Grading				28.1	
Paving (Runway & Taxiway)	0.9	0.0	1.1	0.1	0.2
<b>Total Construction (FY05)</b>	<b>0.9</b>	<b>0.0</b>	<b>1.1</b>	<b>28.1</b>	<b>0.2</b>
Construction (Infrastructure)	4.4	0.0	20.2	1.4	1.4
Grading				28.1	
Paving (Runway & Taxiway)	0.7	0.0	0.8	0.1	0.2
<b>Total Construction (FY06)</b>	<b>5.1</b>	<b>0.0</b>	<b>21.0</b>	<b>29.6</b>	<b>1.6</b>
Commuting POV (only)	-62.4	-0.01	-5.1	-0.2	-8.5
Commuting POV-to-Bus	-25.0	-0.01	-2.0	-0.1	-3.4
Commuting Busses	-3.7	-0.02	-2.2	-0.3	-1.0
Aircraft (TGO+LTO)	-15.1	0.1	0.9	0.1	0.3
Ground Support Equipment	0.7	0.2	3.4	0.2	0.3
<b>Total Operation</b>	<b>-105.5</b>	<b>0.3</b>	<b>-4.9</b>	<b>-0.3</b>	<b>-12.3</b>
Aircraft (R-4806W)	-47.1	0.3	3.2	0.4	-0.6

Predator EA - Emission Calculations  
**Emissions Summary (Edwards)**

**Emissions Summary**

Alternative A					
Emissions (tons/year)					
Source	CO	SOx	NOx	PM	VOC
Aircraft (R-2508)	90.4	0.1	0.9	0.2	1.1
<b>Total</b>	<b>90.4</b>	<b>0.1</b>	<b>0.9</b>	<b>0.2</b>	<b>1.1</b>

(15,000 ft AGL)

Alternative B					
Emissions (tons/year)					
Source	CO	SOx	NOx	PM	VOC
Aircraft (R-2508)	75.0	0.1	1.5	0.3	0.9
<b>Total</b>	<b>75.0</b>	<b>0.1</b>	<b>1.5</b>	<b>0.3</b>	<b>0.9</b>

(15,000 ft AGL)

Alternative C					
Emissions (tons/year)					
Source	CO	SOx	NOx	PM	VOC
Aircraft (R-2508)	-6.7	0.0	0.5	0.1	-0.1
<b>Total</b>	<b>-6.7</b>	<b>0.0</b>	<b>0.5</b>	<b>0.1</b>	<b>-0.1</b>

(15,000 ft AGL)

Predator EA - Emission Calculations  
**Emissions Summary (Nellis)**

**Emissions Summary**

<b>Alternative A</b>					
Emissions (tons/year)					
Source	CO	SOx	NOx	PM	VOC
Construction	0.4	0.0	1.7	0.1	0.1
Grading				0.017	
<b>Total</b>	<b>0.4</b>	<b>0.0</b>	<b>1.7</b>	<b>0.1</b>	<b>0.1</b>

(FY06)

<b>Alternative B</b>					
Emissions (tons/year)					
Source	CO	SOx	NOx	PM	VOC
Construction	0.4	0.0	1.7	0.1	0.1
Grading				0.017	
<b>Total</b>	<b>0.4</b>	<b>0.0</b>	<b>1.7</b>	<b>0.1</b>	<b>0.1</b>

(FY06)

<b>Alternative C</b>					
Emissions (tons/year)					
Source	CO	SOx	NOx	PM	VOC
Construction	0.0	0.0	0.0	0.0	0.0
Grading				0.0	
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

(FY06)